

July 1, 1986

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:

Enclosed is a report from the Market Analysis and Planning Service (MAPS) program entitled U.S. Information Services, Vertical Markets, 1985-1990, Banking and Finance Sector. This report is part of the series entitled Information Services Vertical Markets and should be placed in the binder with the same name.

If you should have any questions, please fee free to call me.

Sincerely,

Michael Orsak
Senior Research Analyst

MO:ml

Enclosure



U.S. INFORMATION SERVICES
VERTICAL MARKETS, 1985-1990
BANKING AND FINANCE SECTOR

MAY 1986





U.S. INFORMATION SERVICES
VERTICAL MARKETS, 1985-1990
BANKING AND FINANCE SECTOR

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U.S. INFORMATION SERVICES
VERTICAL MARKETS, 1985-1990
BANKING AND FINANCE SECTOR

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I ISSUES, TRENDS, AND EVENTS

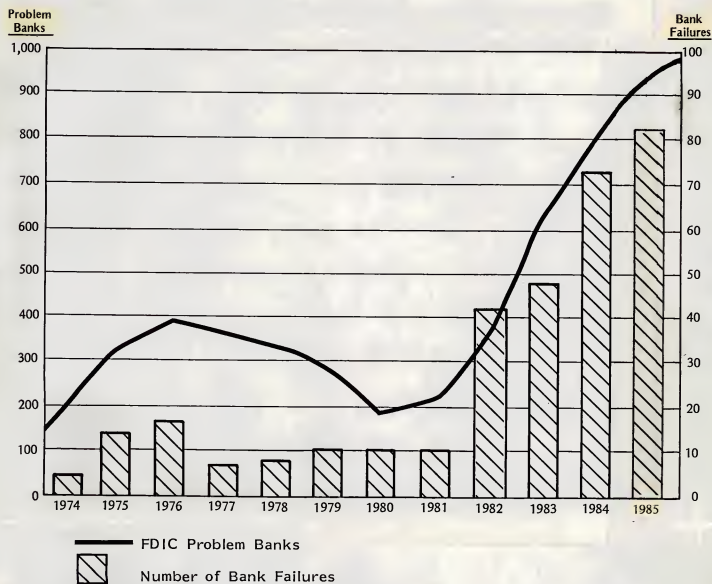
A. INDUSTRY INSTABILITY

- Financial institutions are becoming increasingly unstable, as shown in Exhibit I-1.
 - Government intervention was required to save Continental Illinois, the eleventh largest bank holding company.
 - State S&Ls are failing in Ohio and now in Maryland.
 - Over 12% of farm banks in the Midwest are reporting negative earnings, capital has fallen below 8% of assets, and one to two failures per week have been reported in 1985.
 - Capital is below the legal level for up to 20% of bank holding companies.
 - Aggregate net worth of S&Ls is under 5% of assets.



EXHIBIT I-1

DISTRIBUTION OF FDIC-INSURED PROBLEM BANKS AND BANK FAILURES 1974-1985



Source: Federal Deposit Insurance Corp.



B. INDUSTRY CONSOLIDATION AND RESTRUCTURING

- A major industry consolidation and restructuring will occur, resulting in significant opportunities for alert information services vendors. Selected opportunities are:
 - Purchase of S&L service companies.
 - Acquisition of credit union and correspondent accounts.
 - Network services offerings to associations, holding companies, and other institution groupings.
- Bank mergers and acquisitions continue. Exhibit I-2 lists the many proposed large interstate mergers during 1985.
- Foreign banks are active in the U.S. financial industry; their involvement as owners of U.S. banks during 1984 is described in Exhibit I-3. However, the sale of Crocker Bank by Midland Bank of Great Britain to another U.S. bank, Wells Fargo, may signal the reversal of this trend.

I. INTERSTATE BANKING

- Interstate banking, now a de facto situation, is due to be authorized through federal and state legislation in the forecast period.
 - South Dakota, Delaware, and Maryland are promoting interstate banking.
 - Ohio, Alaska, Washington, and Maine have approved financial institution acquisition by out-of-state financial institutions.



EXHIBIT I-2

1985's LARGEST INTERSTATE BANK ACQUISITIONS

| DATE ANNOUNCED | PROPOSED MERGER | COMBINED TOTAL ASSETS (\$ Billions) |
|-------------------|--|---|
| Sept. 26 | Citicorp with Great Western Financial Corp. | \$160.2 |
| April 19 | Bank of America with Oregon Bank | 118.8 |
| Oct. 17 | Chase Manhattan with Continental Bank in Arizona | 86.8 |
| Aug. 20 | Security Pacific Corp. with Arizona Bancwest Corp. | 51.4 |
| Sept. 3 | Bank of Boston with Rhode Island Hospital Trust | 26.7 |
| July 3 | NCNB, North Carolina with Banker's Trust in South Carolina | 19.0 |
| July 24 | NCNB, North Carolina with Pan American Banks, Inc., in Florida | |
| Dec. 10 | First Atlanta Corporation with Wachovia Corporation | 15.7 |
| Sept. 24 | Sovran Bank, N.A. in Virginia with Suburban Bancorp Maryland | 11.8 |
| Feb. 22 | Citizens and Southern Georgia Corp. with Landmark Banking Corp. of Florida | 11.8 |
| Sept. 17 | Citizens and Southern Georgia Corp. with Citizens and Southern National Bank of South Carolina | 11.0 |
| | Combined Total Assets | \$513.2 |

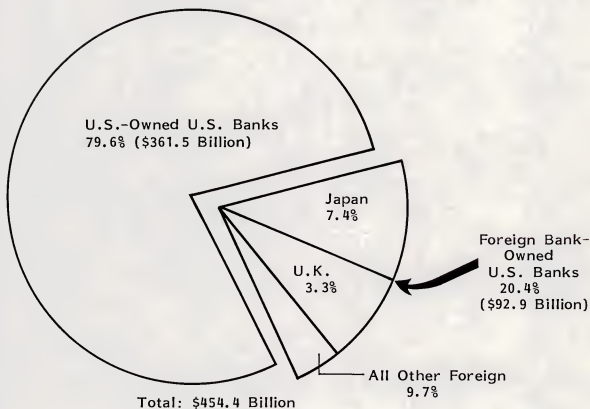
Source: American Banks.

III-BF-4



EXHIBIT I-3

FOREIGN BANKS' SHARE OF THE U.S.
COMMERCIAL AND INDUSTRIAL LENDING MARKET IN 1984



Note: Based on 6/30/84 C&I Loans at all Banking Offices Excluding Finance Companies.

Source: American Banker.



- New England has authorized interstate banking between adjacent states.
- The federal government has permitted establishment of deposit-taking bank branches in selected states by out-of-state financial institutions.
- The realignment of financial institutions on a national basis will require vendors to plan and offer services which are national in scope and market.
 - State legislation, supported by the Supreme Court, is permitting rapid regional consolidation while preventing money center banks from being overly dominant.
 - Independent banks are forming multi-bank holding companies or some new form of operational association to better handle electronic financial transactions.
- Full national banking will be in place toward the end of the decade and into the 1990s.
 - Some 5,000 to 7,000 banking entities will remain, about 35% of the 1985 total.
 - One hundred or so very large money centers and regionals will operate against a grid of independent banks.

2. EXTENSION OF FINANCIAL SERVICES

- Financial institutions are extending their financial services offerings into the marketplace, replacing brick and mortar branches with electronic outlets in the retail marketplace. Examples include:



- Southland Corporation (7-Eleven stores) has already installed 1,500 ATMs in 7-Eleven stores.
 - Safeway stores have installed over 600 ATMs in retail supermarkets.
 - Sixty ATMs have been placed in Eastman Kodak plant and office locations.
- Over 100 shared ATM/POS networks, both regional and national, are consolidating and integrating into what will probably be less than 20 by the end of the decade. Development, integration, and management (FM) of shared financial transaction networks is a strategic target for processing services vendors with national networks.
 - The goal is full relationship-based banking, or offering a total portfolio of financial information services to a bank's clients.
- Services might include brokerage services, investment advice, money market, and other nontraditional types of services. Home banking is also one of these services being considered.
 - Although over 60 financial institutions are involved in home banking pilots, only two, Bank of America and Chemical Bank, currently have significant programs operating. INPUT believes the vendors should approach the home banking market with caution. Banking services should be offered in conjunction with other information services including brokerage, financial, and entertainment information offered through videotext gateway services.
- A broadening of the types of financial services that can be offered is seen for virtually all financial intermediaries, including nonbank corporations whose financial subsidiaries are expected to eventually fall under regulatory authorities through congressional, judicial, and regulatory action.



3. MERCHANT BANKING

- The "Chinese Wall" separating commercial banking and investment banking, whose new name is "merchant banking" (as in England), will erode away or be circumvented (through perpetual legalese challenges). Money center banks will arrange for loans, then sell them off to participants, taking the differential and loan servicing fees in an operation quite similar to that in residential and commercial mortgages.
- Money center banks will be increasingly involved in marketing U.S. Treasury Department debt in international markets. The recycling nature of OPEC-held treasury debt and the rapidly increasing demand for U.S. Treasury debt in Europe that began in 1982 is evidence of this increase.

4. DEREGULATION

- Until recently, the banking industry was the most heavily regulated industry in the country and one of the most decentralized. Banks are chartered by both the federal and state governments. All are inspected and regulated by multiple governmental agencies.
- There are three federal agencies primarily concerned with regulating banks:
 - The Office of the Controller of the Currency (which regulates national banks).
 - The Federal Reserve Board (which regulates bank holding companies and state banks which are members of the Federal Reserve System).
 - Federal Deposit Insurance Corporation (which regulates insured state banks that are not members of the FED).



- In many areas, states, with the federal government's approval, still prevent out-of-state banks from competing against locally owned and mostly independent banks.
- The McFadden Act of 1927 still bans interstate banking by restricting national bank activities to by and large the state in which the national bank is chartered.
- The Douglas Amendment (1956) to the Bank Holding Company Act applied similar restrictions to bank holding companies.
- Finally, the Glass-Steagall Act (1933) continues to restrict services banks can offer (i.e., prohibits underwriting stock offerings, insurance, etc.) and established a "Chinese Wall" between investment (such corporate and personal trust) and banking (wholesale and retail), effectively creating a separate investment-banking industry.
- The above restrictions, lasting for over 40 years, spawned various groups (i.e., The Independent Bankers Association, State Banking Associations, Independent Insurance Agents, etc.), each with something to protect.
- Equilibrium was attained by the checks and balances afforded powerful special interest groups. Both the state and federal bureaucracies acted as bulwarks against change.
- The FED, through Regulation Q, allowed banks (S&Ls and other regulated financial institutions) access to low interest deposits.
 - Banks paid market interest on certificates of deposit of \$100,000 or more.
 - Free or well-below-cost services to small depositors included free checking, several branches, many tellers, no service charge for bad checks, and monthly statements that included cancelled checks.



- Until recently, a great majority of banks, local in nature, existed as much to exercise power as to make money.
 - Most small banks are owned by their management (i.e., chairman, CEO, and local directors).
 - By controlling credit, local banks often control entry and expansion of small businesses.
- The dramatic oil price increases in 1973 and 1979, with resultant inflation, are seen as the precursors of the now accelerating changes in the banking and finance industry.
 - The spread between the average deposit rate and money market rate so widened that investment firms began offering money market funds.
 - Money market funds (themselves not insured) grew from just under \$4 billion in 1977 to nearly \$200 billion by 1981, a 50-fold increase in four years.
- The Depository Institutions Deregulation and Monetary Control Act of 1980, which ordered Regulation Q to be abolished by 1986, is seen as a major influencing factor in changing the structure of the banking and finance industry.
- Pricing deposits at competitive rates (formerly prohibited by Regulation Q) set in motion much of the turmoil currently being experienced in the banking and finance industry.
 - The spread between the price of deposits (funds) and loans greatly narrowed (became negative for the S&L industry), forcing financial intermediaries to price services more realistically in relation to cost and to monitor closely the profitability of all product lines.

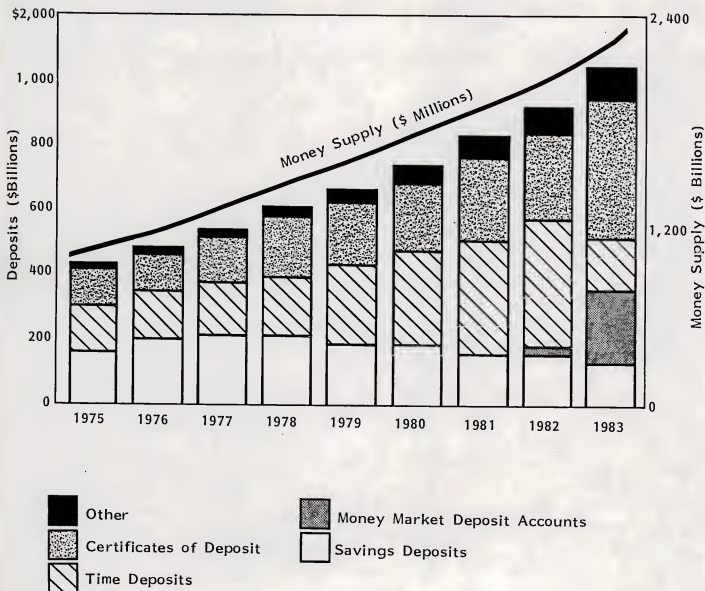


- With the "fat" gone, poorly managed financial institutions (particularly S&Ls) failed by a factor of 10 greater than in the previous decade.
 - Financial institutions having control over costs, primarily through advanced technology, are coming through relatively unscathed.
 - With the interest rate ceiling now lifted for consumer savings accounts, banks hope to see a return flow of capital.
- Exhibit I-4 illustrates the change in bank deposits, beginning in 1975.
 - Savings deposits, once the mainstay of total deposits, have fallen as a portion of total deposits in face of a money supply (M2) which has grown by a factor of 2.5 over an eight-year period.
 - In 1975, less than one-third of total deposits were at near money market rates (primarily certificates of deposit), whereas by 1983 over two-thirds of total deposits (primarily certificates of deposit and money market accounts) were at rates which offer a thin spread between interest cost and loan pricing.
 - The aggregate interest rate paid on consumer deposits (a subset of total deposits) has nearly tripled over the past 20 years, going from 2.7% to 7.2% (1984).
 - Following the Continental Illinois debacle and the forced fire sale in the S&L industry, the political institutions drew a degree of re-regulation in an attempt to restore stability to financial institutions.
 - The FED and now the Federal Home Loan Bank are requiring banks (S&Ls) to increase working capital and equity.



EXHIBIT I-4

DISTRIBUTION OF TOTAL DEPOSITS IN COMMERCIAL BANKS, 1975-1983



Note: Banks were permitted to offer Money Market Accounts in December 1982

Source: Federal Reserve Board.

III-BF-12



- The federally-backed capital note programs are removing negative net worth from financial institution balance sheets.
- Congress is benignly neglecting further deregulation, promising to eliminate nonbank banks, and closing the existing Bank Holding Company Act loophole.

C. TECHNOLOGY ISSUES/TRENDS

I. FINANCIAL TRANSACTION NETWORKS

- The growth in electronic transactions is staggering. It is difficult to see how current batch-oriented retail processing systems can successfully operate under the projected volume of electronic payments.
- Creation of new electronic transaction networks is on the wane. Electronic switches permitting interchange are being implemented between critical services (i.e., VISA, MasterCard, and oil company credit cards). Significant electronic network consolidation is seen through the 1990s.
- Although the private sector could well operate the funds payment system (both electronic fund and check payment), the FED will, in spite of the administration's protestations in favor of private enterprise, retain administrative control of the fund payment system, primarily as a means of controlling some combination of interest rates and the money supply.
- Unlike Europe, the U.S. is seeing the development of POS systems in which the terms are under negotiation between the banks and the retailers. U.S. retailers such as Safeway, Kroeger, and Southland Corporation are willing to install their own ATM/POS systems.



2. BANK DEBIT CARDS VERSUS CREDIT CARDS

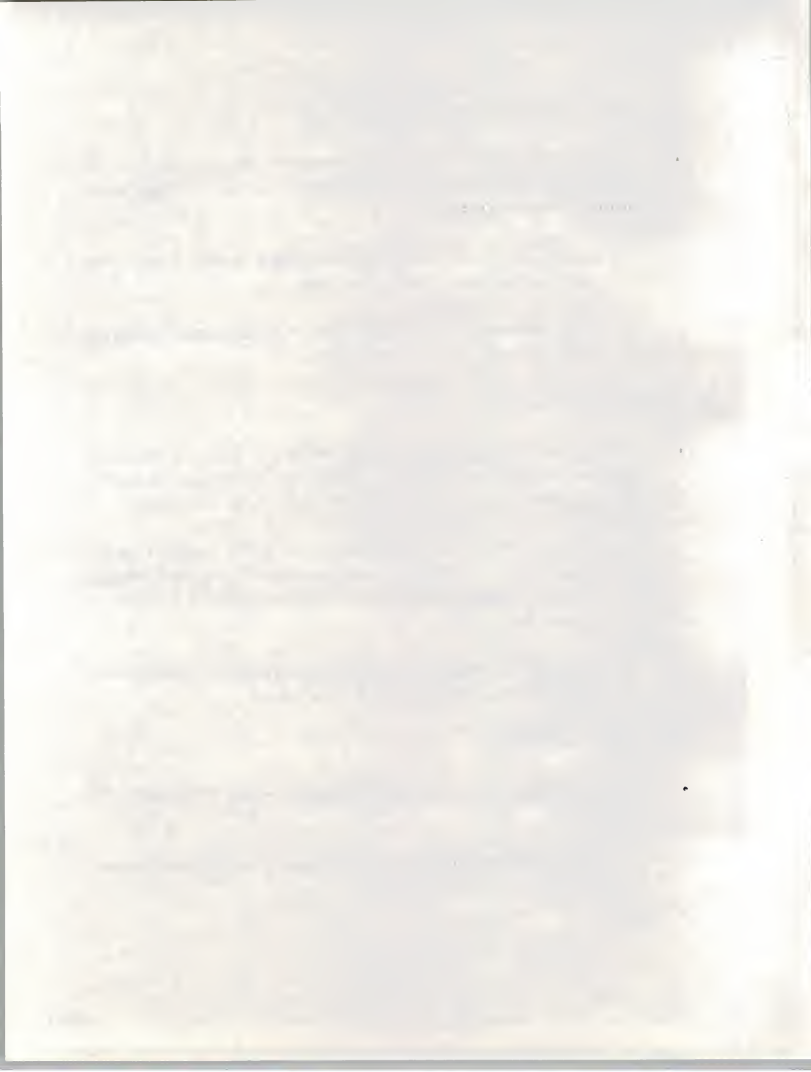
- The bank debit card is in the long term the key to offering a wide range of financial and other consumer services through consumer (including home) financial transaction networks.
 - The number of bank debit cards outstanding is expected to exceed the installed base of credit cards in the 1990s.
 - The transition will occur when consumers are adequately charged for the convenience of credit, including float.

3. OPTICAL MEMORIES

- Optical memory technology (even though set back by Burroughs' withdrawal from the marketplace) is finding first use in local environments for specific applications (but certainly not by IBM in the mainframe environment).
 - Coupled with microprocessor technology, optical memories permit cost-effective distribution of primarily inactive or sparsely changing data in very large data bases for at least reference to the local environment.
 - In the early 1990s IBM is expected to endorse optical technology for office systems, especially when the data is static.

4. CHECK TRUNCATION

- Check truncation using optical memory technology will be in widespread use in the 1990s.
 - Optical memory systems will first be used at the first entry point in the clearance process.



- The technology will finally spread to capture check transaction data at the point of first presentation of the check into the payment system.
- The general consensus of banking executives interviewed is that technology in the form of optical storage and image transmission will become cost-effective in the 1985-1990 timeframe.
- The problem appears to be as much with consumer acceptance of the non-return of the original check as it is with the in-place electronic networks necessary to clear the still slowly growing volume of check transactions. As banks are forced to price services based on true cost, and the consumer is billed for his desire to have the checks returned versus check images or a descriptive statement (GIRO), then check truncation, which will save hundreds of millions in payment systems cost, will become widespread.
- Banking executives (i.e., Mellon Bank) report that check truncation has been effective in selected areas, particularly when offered with packaged financial services.

5. PERSONAL COMPUTER USE BY INVESTORS

- Personal computers have enabled individual investors to become much more active in managing their investment portfolio as well as their IRA and Keogh accounts.
- Interaction between the individual and the market either through discount brokerage or full service brokerage houses is becoming widespread.
- Computer services vendors can benefit from the expanding market through providing software products and network services, including on-line data base for both analysis and, more recently, active trading.



6. THE SMART CARD

- There is a good deal of publicity associated with the microprocessor imbedded or "smart" bank card. MasterCard planned two pilot tests in the fall of 1985.
 - Current smart cards cost between 8-15 times more than plastic magnetic stripe cards, wear out 10 times sooner, and are easily counterfeited by a determined adversary.
 - INPUT's assessment is that smart cards are not likely to be actively used in financial applications before at least 1990.

7. SECURITY

- Fraud is a major issue for credit card transactions and will soon become so for debit card transactions. Nearly \$500 million in 1984, credit card fraud is currently rising over 13% annually. Major opportunities exist for financial transaction systems which authenticate the card and closely tie a valid card with a valid user. Information services vendors must team with security technology vendors to offer secure financial transaction network services.
- Validation of the message originator and authentication of the message itself coupled with adequate encryption are seen as the only viable way to secure electronic transaction networks in the wholesale environment.
 - The DES algorithm is seen to be no longer effective from attack by powerful 32-bit microprocessors.
 - Public key systems are seen to be effective, but are vulnerable in the "people sense" as related to key management and distribution.



- Consumer validation and message authentication requiring on-line operation are seen as the only viable ways of securing consumer transaction systems involving large dollar amounts (i.e., home banking, CMA accounts, etc.).





II MARKET FORECASTS

A. INTRODUCTION

- I. RISING INFORMATION EXPENDITURES OF THE BANKING AND FINANCE INDUSTRY
 - The Banking and Finance sector will continue to offer excellent information services opportunities as the U.S. moves from an industrial to an information society.
 - The SIC for this market sector is 60: commercial banks (602), savings banks (603), savings and loans (612), finance companies and credit unions (614), security and commodity brokers (622), holding companies (671), and investment offices (679).
 - INPUT divides the Banking and Finance sector into four segments: commercial banks, savings and loans, security and commodity firms, and other financial institutions.
 - The category of other financial institutions include: credit unions, federal reserve banks, finance companies, mortgage banking companies, and miscellaneous financial institutions.



- Banking and financial institutions account for more expenditures on information services than any other industry group. Banks and financial institutions also spend a larger share of their total electronic data processing (EDP) expenditures on information services than most groups. The Banking and Finance sector has led the way since the early 1960s, and the average annual growth rate of 22% will maintain this position through the 1990s, as shown in Exhibit II-1.
- Note: These forecasts were generated in 1985. Changing industry conditions, including the economy, may substantially change INPUT's 1986 forecasts.

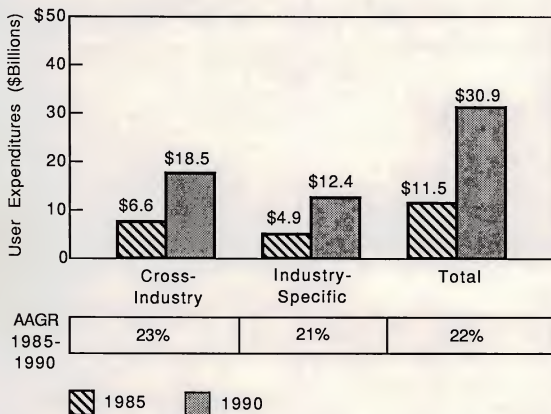
2. THE TREND TOWARD ELECTRONIC PROCESSING

- There is little doubt that the industry is continuing to become "electronic." Examples of this significant trend are:
 - Over 20 billion electronic transactions were processed in 1985. The annual volume is expected to exceed 65 billion transactions within the next decade.
 - Commercial bank personnel growth of over 3% annually during the 1970s has declined to just over 1% annually in 1985 and is expected to decline to just under 1% by the end of the decade. Bank deposit growth of nearly 8% annually is now being supported by increased information services expenditures.
 - Any personnel growth within this segment will occur in new banking areas; the number of people in traditional banking areas will actually shrink.



EXHIBIT II-1

BANKING AND FINANCE SECTOR INFORMATION SERVICES MARKETS BY TYPE OF SERVICE, 1985-1990



AAGR: Average Annual Growth Rate



3. THE CHANGING STRUCTURE AND BLURRING BOUNDARIES OF FINANCIAL INSTITUTIONS

- The changing structure of, as well as the blurring of boundaries between financial institutions greatly widens opportunities for alert vendors offering information services across industry subsectors. Lines of demarkation are blurring not only among financial institutions, but between financial and commercial companies, as shown in Exhibit II-2.
 - Sears, Roebuck and Company has more retail outlets than any financial institution. Sears is second only to Merrill Lynch in the number of full service brokerage accounts and second to Citicorp in consumer loans.
 - Bank of America Corporation has nearly twice as many discount brokerage accounts as its nearest competitor, Fidelity Company, a more traditional securities execution vendor.
 - American Express Company, an emerging financial conglomerate, is second only to Fidelity Company in the number of mutual fund accounts and to Merrill Lynch Company for the popular Cash Management (CMA) financial account.
 - Prudential Insurance Company of America has more commercial finance receivable than does Manufacturers Hanover Corporation, a New York Money Center bank.
 - Household International, parent of Household Finance, is second only to Citicorp, the nation's largest bank, in consumer finance receivables.



EXHIBIT II-2

LEADING PROVIDERS OF BANKING AND FINANCE INDUSTRY FINANCIAL SERVICES

| Company | Financial Services Outlets (000) | Discount Brokerage Accounts (000) | Number of Mutual Fund Accounts (000) | IRA & Keogh (000) | Full Service Brokerage Accounts (000) | Cash Management Accounts (000) | Consumer Loans (\$000) | Residential First Mortgages (\$000) | Commercial Finance Receivables (\$000) | Consumer Finance Receivables (\$000) |
|--|-------------------------------------|--------------------------------------|---|----------------------|---|-----------------------------------|---------------------------|--|---|---|
| Travelers Company | 120 | | | | | | | | | |
| Sears,Roebuck and Company | 7 | | | | 1,345 | | \$12,000 | | | |
| Bank of America | | 650 | | 665 | | | | \$16,500 | | |
| Fidelity Company | | 375 | 1,500 | | | | | | | |
| American Express Company | | | 1,413 | | | 172 | | | | |
| Merrill Lynch & Company | | | | 800 | 4,800 | 1,000 | | | | |
| H.F. Ahmanson Company | | | | | | | | \$15,400 | | |
| Prudential Insurance Company of America | | | | | | | | | \$1,545 | |
| Manufacturers Hanover Corporation | | | | | | | | | \$1,100 | |
| Citicorp | | | | | | | \$29,000 | | | \$8,200 |
| Household International Corporation | | | | | | | | | | \$4,727 |

Source: American Banker.

III-BF-23



B. SECTOR FORECAST, 1985-1990

I. COMMERCIAL BANKS

- As shown in Exhibit II-3, commercial banks represent the largest of the four sectors that comprise the Banking and Finance sector total information services market. With user expenditures approaching \$7 billion, the commercial banking sector represents nearly 60% of total user expenditures in 1985.
 - Nearly 45% of total expenditures are for vertical industry-specific services. These services include correspondent bank processing of nearly \$700 million and credit card authorization and check guarantee services of another \$365 million.
 - Just over 55% of total expenditures are for cross-industry applications, including systems software and professional services as well as applications such as personnel, payroll, accounting, and financial management and planning.
 - The overall annual growth rate of commercial bank user expenditures will be sustained above the industry average as banks continue to go on-line and as they increase the array of financial services delivered through electronic media.
 - Large money center banks will dominate this segment as they move in to replace many of the failed S&Ls.

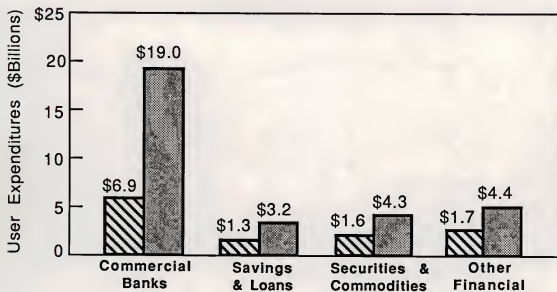
2. SAVINGS AND LOANS

- Operating in volatile financial markets and with profitability increasingly sensitive to interest rate spreads, the Savings & Loan segment represents just over 10% of total segment expenditures.



EXHIBIT II-3

**BANKING AND FINANCE SECTOR
INFORMATION SERVICES BY INDUSTRY, 1985-1990**



| | | | | |
|-----------|-----|-----|-----|-----|
| AAGR | | | | |
| 1985-1990 | 22% | 20% | 22% | 21% |

 1985
  1990

AAGR: Average Annual Growth Rate



- A major S&L restructuring appears inevitable during the forecast period, offering new opportunities but restricting annual growth to just under 20%. Computerized mortgage networks, a new computer services opportunity, will become widespread during the forecast period. By offering lendable funds on a national basis, mortgage market network services will be in great demand because they reduce market interest rate imperfections.

3. SECURITIES AND COMMODITIES ORGANIZATIONS

- The Securities and Commodities market segment (currently just over 14% of total expenditures) is a heavy user of cross-industry services (61% of total sector expenditures) including on-line data bases and VAN services.
- Industry-specific applications will benefit from national, if not worldwide, electronic trading and from security information services to individuals.
- Cross-industry growth will result from the proliferation of personal computers as workstations throughout the dealer and investor marketplace.

4. OTHER BANKING/FINANCE INSTITUTIONS

- Other financial institution expenditures, nearly 16% of the 1985 total, are related to credit unions, mortgage banks, finance companies, the Federal Reserve and Federal Home Loan Banks, and miscellaneous financial institutions.
- Formation of the Credit Union Central Bank gives credit unions central bank funding and services similar to those of the Federal Reserve and Federal Home Loan Bank, including funds availability, discount, share draft processing, and member borrowing.



- Operation of Automatic Clearing Houses (ACH), ACH network services, and local check guarantee associations by the private sector in place of the Federal Reserve are examples of new information services opportunities in this sector.

C. INDUSTRY-SPECIFIC SERVICES DELIVERY MODE FORECAST, 1985-1990

1. PROCESSING SERVICES

- The Banking and Finance segment is a heavy user of processing services. The combination of remote computing services (RCS), batch processing, and processing facilities management, as shown in Exhibit II-4, comprises nearly 70% of total 1985 industry-specific information services expenditures. Although this proportion will drop to 60% by 1990, the shift of existing applications to distributed on-site mini and microcomputers plus new opportunities will sustain processing services.
- It is clear that the market for check/credit card processing is going electronic. Installation of shared POS/ATM networks are extending banking and finance institution operations into the consumer marketplace. Over 25% of existing ATMs are in shared networks. The major portion of the shared installed base is located at supermarkets, truck service centers, casinos, and more recently in corporate buildings.

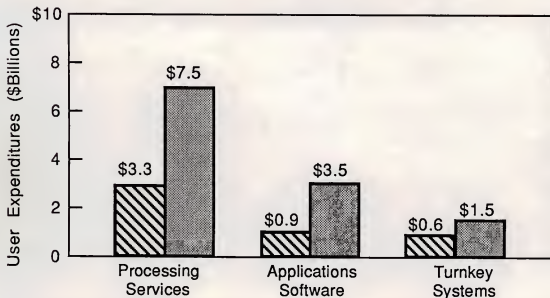
2. APPLICATIONS SOFTWARE

- The applications software segment will grow rapidly as a result of a number of factors:
 - The growing need for financial institutions to integrate applications about an expanding customer data base to successfully market an increasing array of financial services.




EXHIBIT II-4

**BANKING AND FINANCE SECTOR
INDUSTRY-SPECIFIC INFORMATION SERVICES MARKET
BY DELIVERY MODE, 1985-1990**



AAGR
1985-
1990

| | | |
|-----|-----|-----|
| 18% | 30% | 18% |
|-----|-----|-----|

 1985
  1990

AAGR: Average Annual Growth Rate



- The need for on-line interactive software to process an increasing volume of electronic transactions.
- The problems with Anacomp, and more recently Hogan Systems, notwithstanding, widespread use of electronic transaction systems depends on financial institutions having on-line interactive capability.
- Microcomputer software has found wide acceptance in the Banking and Finance sector, resulting in an annual growth rate exceeding 30% over the five-year forecast period, with 1990 expenditures forecast at an impressive \$856 million. A few of many examples are:
 - BankLink II, Chemical Bank's corporate cash management service, is now available on the IBM PC.
 - Mainline processing for community banks will soon be available on the IBM PC. IBM is in joint software development with the American Bankers Association.
 - IBM and Tandy PCs are being widely used in agricultural banks in the Midwest using software developed by Agri-System Development, Inc. and FBS Systems, Inc.

3. TURNKEY SYSTEMS

- The strong growth in turnkey systems in the Banking and Finance segment of 18% annually results from:
 - A concerted effort on the part of hardware vendors to sponsor independent service organizations (ISO) and value-added reseller (VAR) arrangements.



- The widespread utilization of personal computers for specialized banking functions, such as letters of credit, loan origination, secondary mortgage packaging in larger financial institutions, and branch automation.
- The cost-effectiveness of microprocessor-driven turnkey systems for community banks, credit unions, and other smaller financial institutions.
- The overall growth is inhibited by the volatility of this delivery mode market and the relative "frailty" of many of the vendors.

D. DEMOGRAPHIC FORECAST, 1985-1990

- The Banking and Finance industry is in the process of restructuring as well as change. The net result will be somewhat fewer sale/site opportunities with a corresponding increase in revenue potential per site.

I. INSTITUTIONS DECLINE

- The number of institutions is, as shown in Exhibit II-5, expected to drop to just under 30,000 by 1990, an overall decrease of 28% over the five-year forecast period. By 1990 there will be:
 - 10,300 commercial banks.
 - 2,400 savings institutions.
 - 13,000 credit unions.
 - 315 security and commodity brokers.



EXHIBIT II-5

**DEMOGRAPHIC ANALYSIS
BANKING AND FINANCE SEGMENT**

| ITEM | 1982 | 1985 | 1990 |
|---|-----------|-----------|-----------|
| Number of Institutions | 43,183 | 41,305 | 29,740 |
| Number of Employees | 2,810,000 | 2,973,000 | 3,122,000 |
| Assets (\$ Billions) | \$3,158 | \$3,769 | \$5,352 |
| Information Systems Departments Spending (\$ Millions) | \$6,316 | \$8,709 | \$13,277 |
| Information Systems Departments Spending per Employee | \$2.25 | \$2.93 | \$4.25 |
| End-User Information Systems Spending (\$ Millions) | \$322 | \$757 | \$1,475 |
| End-User Information Systems Spending per Employee | \$0.12 | \$0.25 | \$0.47 |



- 700 mortgage bankers.
- 12 Federal Reserve Banks.
- 12 Federal Home Loan Banks.
- 2,976 other financial institutions, including investment companies, development banks and cooperatives.
- It is possible that a combination of competition, deregulation, and severe economic recession could accelerate restructuring, reducing the number of sale/site opportunities well below 20,000.

2. EMPLOYMENT ESTIMATE

- The slow growth in the number of employees in the Banking and Finance segment attests to the impact of automation on banking and finance institutions. Employment growth for the 1982-1985 timeframe was only 1.3% annually. The growth will drop to less than 1% annually for the 1985-1990 timeframe, in contrast to nearly 8% annual growth in total aggregate assets.
- 1985 employment is estimated at:
 - Commercial banks - 1,640,000.
 - Savings institutions - 310,000.
 - Credit unions - 370,000.
 - Security and commodity brokers - 120,000.
 - Mortgage bankers - 111,000.
 - Other financial institutions - 420,000.



III COMPETITIVE DEVELOPMENTS

A. INTRODUCTION

- Complex supplier and competitor relationships are proliferating in the financial services market due to the changes and new opportunities in the banking and finance segment.
- Now providing financial services directly to consumer customers are banks, securities firms, consumer financial companies, credit unions, and retailers.
- Corporate banking is also increasingly competitive on the lending side.
 - Through the commercial paper market, industrial corporations (i.e., IBM, General Motors, etc.) can obtain financing at better money market rates than commercial banks can offer their most credit-worthy customers.
 - Money market instruments marketed by investment bankers (including "junk-bonds") often result in money market rates well below those which can be profitably offered by financial institutions.
- Commercial banks have traditionally been providers of information services to their correspondents, to corporate clients, and, on an increasing basis, through their correspondents to the correspondents' corporate clients.



- In a recent study on correspondent bank processing, INPUT determined that commercial banks provided well over one-third of the computer services to predominantly smaller banks:
 - Services include demand deposit accounting, check clearance, check processing, savings, loans, administrative/CIS, and electronic transactions including ACH and ATM/POS bank card services.
- The bank information services market segment is seen to be in the process of consolidation. Many banks are involved in selling data processing services to other financial institutions and computer services vendors. However, a number of regional banks have elected to expand their positions in the financial information services marketplace.
- Most of the major money center banks have been testing interstate banking through the establishment of a limited number of "nonbank banks" as another method besides acquiring "sick" S&Ls to gain interstate presence.
 - The recent Supreme Court decision related to Dimension Financial Corporation of Denver limiting the Federal Reserve's regulatory power over limited service banks is seen as opening the gate for a deluge (well over 500) of bank holding company applications for limited services banks.
 - Political conflicts between Congress and the President and within the Congress between the House and the Senate are seen as preventing the successful passage of limiting legislation until at least the new congressional session (1987-1988).
- Invasion of U.S. international lending markets by non-U.S. banks will not be a significant threat to U.S. financial institutions.



- Foreign ownership of U.S. banks is seen as a necessary and beneficial condition to the orderly conduct of international financial markets.
- The numbers of vendors involved in the market are substantial.
 - Over 400 information services and commercial bank vendors offer industry-specific information services to commercial banks. The market is characterized by a large number of specialized vendors with no one vendor dominating the marketplace. Major vendors are ADP, NCR, EDS, CDC, Systematics, American Express, Burroughs, GEISCO, IBM, MTech, Mellon, Citicorp, and Chase.
 - About 200 vendors supply savings and loan institutions, led by NCR, CDC, EDS, Burroughs, ADP, IBM, Citicorp Dataline Service, and Florida Information Management.
 - Over 40 vendors market to security and commodity firms with Quotron Systems and ADP holding major shares. Telerate, Reuters, Allied Information Systems, McGraw-Hill, Bradford, Chase, IDC, and Dow Jones are others.
 - Finally, some 150 vendors serve the remaining financial categories. Leading vendors are CDC, EDS, Users Inc., Chase, Dial Systems, Citicorp, Burroughs, and NCR.
- These suppliers are of three basic types--financial institutions, information services vendors, and commercial institutions.
- The 1985 market shares of ten leading vendors are given in Exhibit III-1; their company profiles follow.
- Significant competitive activity by additional participants in the industry is discussed by vendor type.

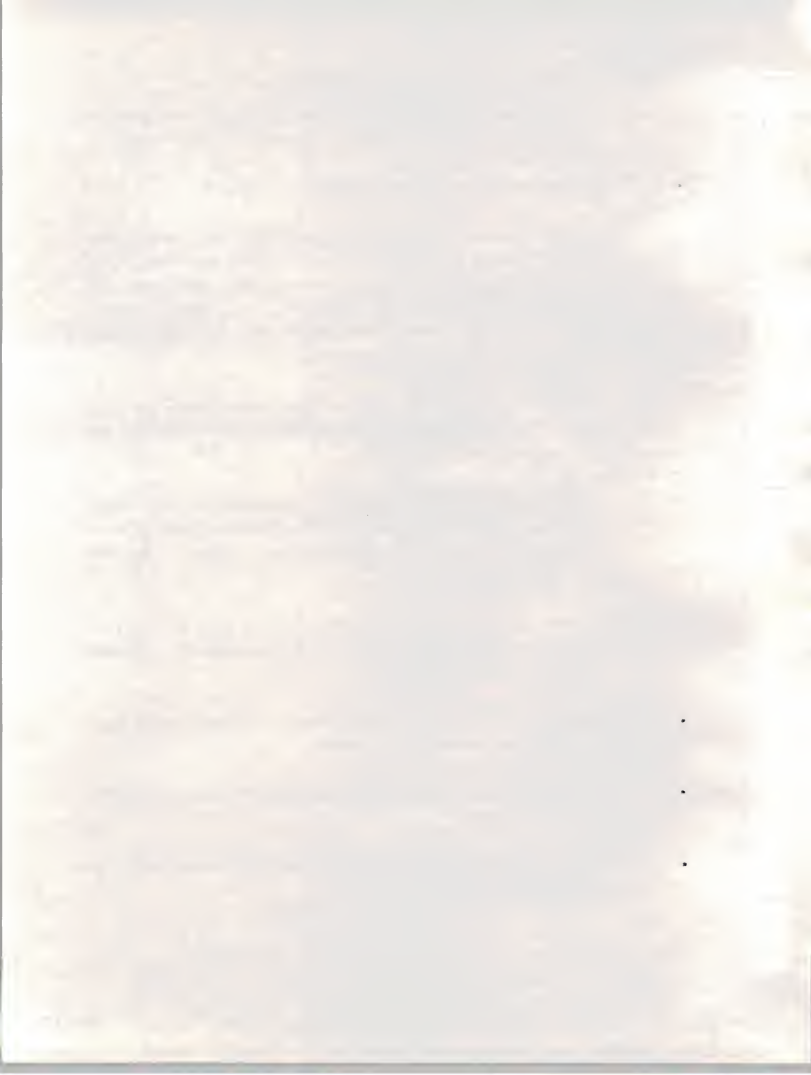


EXHIBIT III-1

**MARKET SHARES OF SELECTED
BANKING AND FINANCE VENDORS, 1985**

| VENDOR | BANKING AND FINANCE SECTOR INDUSTRY PARTICIPATION | TOTAL 1985 REVENUES (U.S. \$ Millions) | BANKING AND FINANCE SECTOR MARKET SHARE (Percent) |
|------------------------------------|--|---|--|
| Automatic Data Processing (ADP) | All | \$1,101 | 6.0% |
| NCR | All, except Security | \$4,317 | 4.9 |
| Quotron | All, except Savings and Loan | \$206 | 4.2 |
| Control Data | All, except Security | \$3,680 | 3.6 |
| Telerate | All, except Savings and Loan | \$161 | 3.5 |
| EDS (Subsidiary GM) | All, except Security | \$3,406 | 3.4 |
| Burroughs | All, except Security | \$5,038 | 3.2 |
| IBM | All | \$50,056 | 3.1 |
| Chase | All | \$9,733 | 3.1 |
| Citicorp | All | \$22,504 | 2.4 |
| Subtotal | | | 37.4% |
| Others | | | 62.6% |
| Total | | | 100.0% |

*Commercial Banks, Savings and Loans, Security and Commodity, Other Financial.



B. VENDOR PROFILES

I. AUTOMATIC DATA PROCESSING (ADP)

a. Products and Services

- ADP provides a wide variety of information services to commercial banks. Services include:
 - Mainline processing for some 100 banks through regional centers.
 - Integrated systems for trust and other applications.
 - Payroll services on a private-label basis.
 - Shared ATM network services.
 - Home banking, pay by phone.
- ADP provides remote processing services for over 200 S&Ls through inter-connected centers. Recent services include the ability to access shared ATM networks.
- ADP offers remote processing and shared ATM networks to credit unions.
- One of the leaders in brokerage back office processing, ADP now offers market trade data through its Trend Setter system as well as a service which links users to Value Line and other research sources.

b. Banking and Finance Sector Industry Markets

- ADP participates in all segments of the banking and finance market sector.



c. Company Strategy

- After adding revenues from all products and services, ADP is shown to have the industry's largest market share.
- The 36-year-old company has shown consistent growth of over 10% annually since 1961. Payroll and accounting services account for over 50% of revenues.
- ADP growth includes continuing acquisition activity.
 - ADP took over payroll and accounting services from Computer Sciences Corporation and Security Pacific Bank in recent years.
 - ADP expanded its ATM network into Illinois and New England by purchasing two ATM companies.
 - A major provider of back office processing services, ADP has moved into the front office with its recent acquisition of GTE Quotation Services and Bunker Ramo Information Services.
- By becoming a reseller of Digital Equipment Corporation's DEC system and IBM's PC hardware, ADP has been able to forestall loss of revenue from declines in on-site processing.

d. Recent Activities

- ADP's Trend Setter system uses Convergent Technologies' desktop computers to receive stock market quotes and news via satellite. Over 200 banks and brokerages in the U.S. and Europe use the system.



e. Future Direction

- Although ADP's back office brokerage services business has grown slowly, the stock market comeback should give it a needed boost.
- ADP plans to be a leader in providing trading data to the security and commodity segment currently dominated by Quotron, although it will face stiff competition from Merrill Lynch/IBM and other new entrants.
- ADP has also targeted a national ATM network as one of its basic services to the industry. Its ATM division generated profits for the first time in 1985.
- Remote processing will continue to be a major service product offered to smaller financial institutions.

2. BURROUGHS

a. Products and Services

- In competition with NCR, Burroughs offers integrated systems to small independent banks and software products to support its distributed processors in medium- to large-sized banks.
- Burroughs Corporation offers integrated systems to credit unions and item processing software packages to the Federal Reserve for check clearance.
- Burroughs offers integrated systems to smaller S&Ls and a full line of software products for S&L processing on Burroughs mainframes.

b. Banking and Finance Sector Industry Markets

- Burroughs participates in all the segments except securities and commodities.



- The company provides applications software, hardware, and integrated systems to its customers but does not offer processing services.

c. Company Strategy

- Burroughs is striving to become more service-oriented, although it retains its hardware focus.
- Hardware products have expanded to include new office automation software, intelligent workstations, and communications networks.
- Burroughs mainframes, for example the A-15 processor, still provide a strong anchor for the rest of the company, and the A-3 and A-9, newer, small- and medium-sized machines, were well accepted by the company's traditional customers.
- The B-25 multi-user computer workstation competes favorably against the IBM/AT in price and performance and contributed to Burroughs' 5% revenue gain in 1985. Burroughs manufactures the B-25 internally but distributes the product through dealers. Its dealer network is being expanded to some 450 dealers.
- Burroughs is now active in media and storage peripherals following its acquisition of Memorex in 1981.

d. Recent Activities

- Production problems have plagued Memorex but are being resolved by reorganization, new production management, and closer adherence to quality control.
- Memorex is now one of the few remaining suppliers of IBM-compatible reel-to-reel tape drives. Its new 3680 disk drive, a top-of-the-line product is in demand, but Memorex has dropped out of the OEM disk drive business.



- Burroughs made an offer to purchase rival computer mainframer Sperry in 1985, which has been accepted.

e. Future Direction

- Burroughs' main hope of viability against IBM seems to be to merge with another large computer firm.
- Burroughs will continue to market primarily to its existing customer base, especially in banks and financial institutions.
- Products will be sold as integrated solutions rather than single items; for example, workstations for a work group rather than personal computers. For success, Burroughs will seek to improve its telecommunications technology and its range of applications software.

3. CHASE MANHATTAN

a. Products and Services

- Chase provides processing services to other commercial banks. Applications are for retail and corporate customer services and bank administration.
- Chase, through its subsidiary Power, Inc., provides processing services to mortgage bankers.
- Through its IDC subsidiary, Chase provides on-line data base services to the Federal Reserve for interest rate and money market aggregate economic analysis and forecasting.
- Chase also provides on-line data base services for company evaluation, interest and foreign exchange rate forecasting, and merger and acquisition analysis.



b. Banking and Finance Sector Industry Markets

- With the recent acquisition of savings and loan bank services, Chase participates in all market segments.

c. Company Strategy

- As a money center bank, Chase has been restricted competitively by banking regulations. It has not been allowed to participate in regional banking pacts.
 - Chase, like Citicorp, is avoiding the restriction by acquiring S&Ls in other states and converting them to commercial banks.
 - Chase plans to acquire banks in states that allow nationwide banking, such as Arizona.
- Chase is also developing its investment bank services; for example:
 - Mergers and acquisitions.
 - European market underwriting.
 - Interest rate swaps.

d. Recent Activities

- Chase bought nine S&Ls in Ohio and Maryland in 1985. It is reopening them as commercial banks.

e. Future Direction

- Chase will continue building its on-line data base services for various markets.



- Some 25% of revenues may come from investment banking in the future. Investment banking clients--the same customers who have been borrowers of bank loans for years--will present opportunities for new product development.

4. CITICORP

a. Products and Services

- Citicorp, one of the nation's largest commercial banks, provides a wide range of products and services to other financial institutions.
 - Citicorp's offerings include integrated systems for branch bank operation.
 - Citicorp is active in providing both integrated systems and processing services to credit unions, as well as providing processing services and software products to mortgage banking firms.
 - In addition to offering processing services through regional centers, Citicorp is offering integrated systems as well as selected financial analysis and control software products to smaller S&Ls.
 - Citibank's electronic banking network serves nearly 12,000 U.S. clients with more than 100 corporate financial information service products.
 - Citicorp now operates consumer banking facilities in 41 states and has banking relationships with nearly 12 million consumers nationwide.

b. Banking and Finance Sector Industry Markets

- Citicorp serves all four market segments.

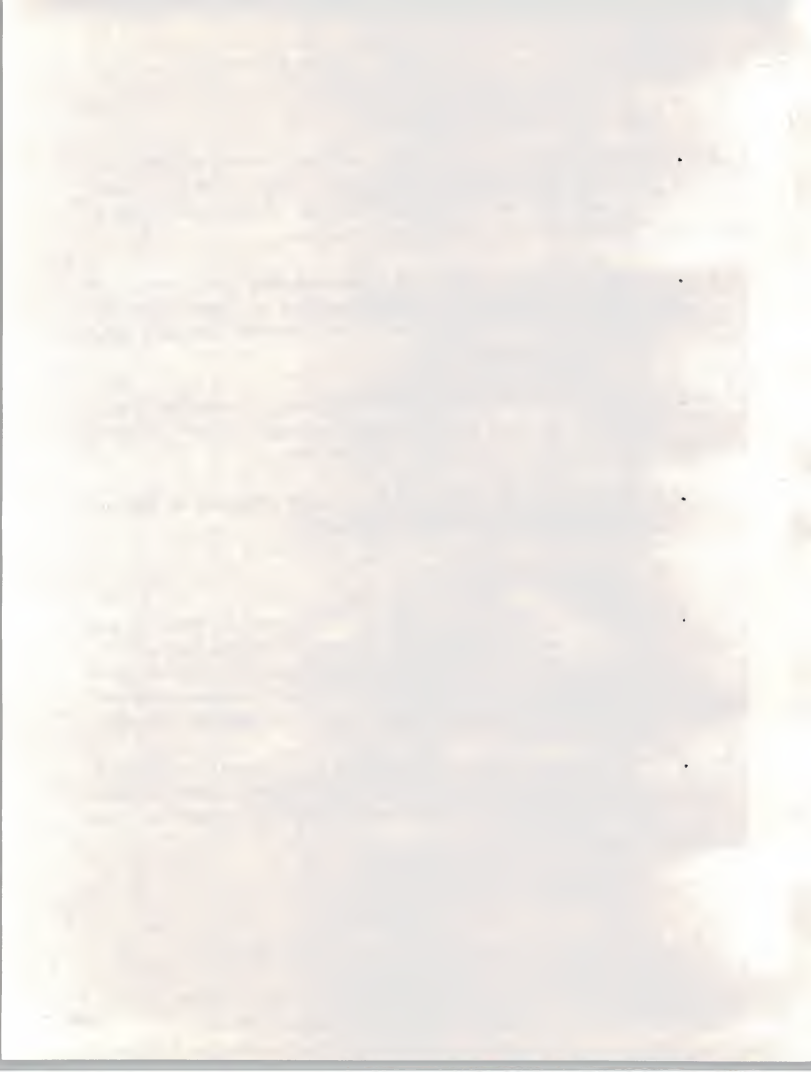


c. Company Strategy

- Money center banks such as Citicorp and Bank of America view S&Ls as an entree to nationwide banking. Active in S&L acquisitions, Citicorp obtained a 60-branch S&L network in Illinois and 34-branch S&L institutions in Florida to add to its 92-branch Citicorp Savings of California.
- Citicorp is decentralizing its processing operations, having moved check processing to its Delaware-based operation facility and credit card servicing activities to South Dakota, and is building a Nevada-based processing center for handling mortgage operations.
- Citicorp's investment in communications technology on a global basis has been over \$3 billion over the last five years, an amount exceeding the equity capital of virtually all of the nation's largest banks.
- Citicorp under new chairman John Reed has reorganized its corporate structure to be better positioned in capital markets.

d. Recent Activities

- Transaction Technology, Inc. (TTI), a subsidiary charged with developing electronic consumer banking, is due to release its Consumer Banking System (CBS). CBS is customer rather than account based. It will fully automate back office processing through on-line applications to a common data base. CBS will interconnect to Citibank's completely automated branch facilities.
- Citicorp's latest entry into home banking is its full feature FOCUS system, a PC-based money management account which combines checking, overdraft lines, automatic daily sweep into mutual funds, VISA debit, installment loans, and discount brokerage.



- The Global Communication Network enables Citicorp to become a low-cost provider of international as well as national wholesale financial services. Its global wholesale communications network, which has direct telecommunications ability for 24 hours a day, 7 days a week in 140 cities spanning 85 countries, operates five major nodes under the standard X.25 linkage.

e. Future Direction

- Citicorp intends to be a major provider of on-line international financial services.
- In addition to wholesale services, Citicorp will expand consumer electronic banking services internationally. ATMs are already available for access in Hong Kong and Europe.
- Citicorp's financial strength allows it to expand into additional market areas through acquisition, as it has done through purchase of savings and loan groups and its recent attempt to take over Quotron Systems.

5. CONTROL DATA CORPORATION (CDC)

a. Products and Services

- CDC provides a wide variety of information services to commercial banks, including:
 - Payroll and other automated business services on a private-label basis.
 - Funds management, lock box, and other remote processing for corporate banking.
 - On-line data base services including economic analysis, merger and acquisition, and money market operations.



- CDC, through its Business Information Services (BIS) group, provides a wide array of services to S&Ls, including:
 - Remote processing services for S&L financial planning.
 - On-line data base services for financial analysis and mergers/acquisitions.
 - Integrated systems for auto dealer floor planning.
- CDC offers information services in two areas to other financial institutions:
 - Processing services and integrated systems to credit unions.
 - Processing services to finance companies through its Action Data Services group.

b. Banking and Finance Sector Industry Markets

- CDC provides processing services to all financial segments except security and commodity organizations.
- CDC also provides limited hardware, software, and integrated systems to selected markets (credit unions, banks).

c. Company Strategy

- Losses from its computer operations are providing incentive for further development of CDC's service business.
- Like Burroughs, CDC was a strong contender in the peripherals market, but competition and management problems have caused a decline in the company's market share from 50% to some 27%.



- CDC must find a way to raise cash and maneuver its way to profitability once again. Consequently, CDC is selling off parts of its service businesses; its realty and relocation services subsidiary was sold in 1985.

d. Recent Activities

- CDC put up its Commercial Credit Company for sale. (Commercial Credit was involved in the collapse of Ohio thrift institutions, costing it over \$20 million.)
- CDC has recently acquired the California division of Bank of America's DECIMUS Data Service Company.

e. Future Direction

- CDC will undoubtedly focus on the profitable parts of its businesses in order to regain market viability.
- Financial services are an area of strength for the company and should be one of those subjects for concentration.
- A well-capitalized partner would brighten the company's future.

6. EDS

a. Products and Services

- EDS, the major provider of facilities management services to over 550 commercial banks and remote processing for an additional 50 commercial banks, also supplies integrated systems to community banks using the IBM System 36.



- EDS services over 50 S&Ls, either directly by FM or emanating from FM data centers. EDS also provides integrated systems for S&L operation, utilizing the IBM System 36 and more recently their Centurion computers.
- EDS is a major provider of information services to credit unions. Services include:
 - Facilities management for the national association of over 2,000 credit unions.
 - Processing services for another 1,100 credit unions. Together these credit unions total 10 million members.
 - Integrated systems using Centurion micro systems.
- b. Banking and Finance Sector Industry Markets
- EDS participates in all segments with the exception of securities and commodities.
- c. Company Strategy
- EDS became a subsidiary of General Motors in October 1984 at a cost of \$2.5 billion but still retains its corporate identity.
- GM's plans for EDS include retaining and expanding its traditional business while offering new services such as funds transfer.
- GMAC's plans to enter home mortgage banking may also depend on EDS' expertise.



- GM acquired an extensive satellite network when it bought Hughes Aircraft Company in 1985. This telecommunications system will permit EDS to pioneer new financial service markets.

d. Recent Activities

- In a plan to bolster its implementation capability, Hogan Software has made a joint agreement with EDS to implement Hogan's banking software for current EDS and other clients.
- EDS also has a joint agreement with Cullinet for implementing Cullinet DBMS software for banking clients.

e. Future Direction

- GM has other plans for EDS outside banking and finance, which may spread the company too thin to compete effectively.
- EDS is also having to adjust to GM's different contracting systems and to train some 10,000 GM transfers.
- EDS' ability to juggle all of its new assignments with its traditional business and the degree of support provided by GM will determine its success.

7. IBM

a. Products and Services

- IBM provides item and transaction processing software for its check processing and retail financial terminals directly to banks of all sizes.
- IBM recently signed an agreement to be the exclusive distributor of Hogan Systems software in the U.S.



- IBM supplies item and transaction processing software to the Federal Reserve and Federal Home Loan Banks.
- IBM provides software products to S&Ls for item and transaction processing.
 - Very large S&Ls accomplish their own NOW account processing.
 - Transaction processing involves branch and floor financial terminal operation.
- b. Banking and Finance Sector Industry Markets
- IBM is active in all segments now that it has joint ventures in the securities and commodities field.
- c. Company Strategy
- Although IBM does not dominate banking and finance, it has a substantial installed base of hardware in financial institutions.
 - The dominance of IBM PCs as low-cost brokerage and treasury workstations or for other personal computing use in banks gives IBM a decided advantage.
 - IBM has the capacity to increase its financial services market share dramatically.
 - IBM is actively building its telecommunications networks, even though it recently sold its Satellite Business Systems to MCI becoming MCI's largest shareholder.



- On the telecommunications equipment end, IBM, by virtue of its Rolm subsidiary, is one of the nation's largest suppliers.

d. Recent Activities

- IBM, in a joint venture with Merrill Lynch and now McGraw-Hill, is launching IMNET to provide a national quotation and trading service to both brokerage houses and individual investors. Transmission to the individual investor in the home will be via unused capacity of the Public Broadcasting System (PBS).
- Recently, there was an announcement of a joint venture between IBM and Merrill Lynch to offer stock quotation services utilizing the IBM PC with software supplied by Monchik-Weber. Such a service, delivered through a satellite communications network, is likely to alter and expand the market for delivery of information services to security and commodity firms.

e. Future Direction

- IBM appears to be concentrating on the delivery of services and software rather than development of its own applications software.
- In recent years IBM has shown an interest in working with outside software suppliers.
- More joint ventures, perhaps some strategic partnering with large financial institutions, could be attractive to IBM.
- The IBM pattern of "wait and see how the industry develops" will apply in this case.



8. NCR

a. Products and Services

- NCR, specializing in integrated systems for small community banks, also supplies software products for retail processing in conjunction with its hardware offerings to medium-sized banks.
- NCR is a leading vendor in the S&L marketplace.
 - Remote processing is provided to over 500 S&Ls through nine regional centers.
 - NCR supplies integrated systems to smaller S&Ls.
 - Software products are provided to larger S&Ls that utilize NCR mainframes.
- NCR provides integrated systems to credit unions and software products operating on NCR processors to finance companies and credit unions.
- NCR is the leading supplier of ATM, POS, and bank teller terminals.

b. Banking and Finance Sector Industry Markets

- NCR is active in all market segments except securities and commodities.

c. Company Strategy

- NCR is concentrating on transaction processing and funds transfer using NCR hardware. Such equipment represents about 26% of revenues.



- It is a financially cautious company, and with little debt, some \$800 million in cash, and a 14.3% equity return appears to be one of the more stable vendors.
- Although NCR is concentrating on small systems and no longer develops large mainframes, it recently introduced some midsize machines for electronic funds transfer and credit checks. Such machines can be enhanced when needed and offer "fault tolerance," a design that permits continued running even if some part of the system fails.
- NCR is working with software companies to provide transaction processing packages and to upgrade older NCR software.

d. Recent Activities

- NCR Data Services Company has acquired the Bank Services Division of Anacomp. ATM/POS financial transactions support is provided through its affiliation with Universal Money Centers in which NCR holds a minority interest.
- The new NCR 9800 series of machines, introduced in early 1986, can handle 26 transactions per second.

e. Future Direction

- Although NCR will sell first to its existing customers, it plans to challenge Tandem and IBM in high-end transaction processing in the future.



9. QUOTRON

a. Products and Services

- Approximately 20% of Quotron Systems information processing revenue is derived from commercial banks. Quotron is expanding its service offerings to encompass personal financial computing and financial office automation.
 - Financial inquiry services are offered to trust departments.
 - Financial information services are offered to corporate banking divisions.
 - Inquiry and financial information services are offered to the investment management division.
 - Financial inquiry and information services are offered as part of discount brokerage operations.
- Quotron Systems provides stock quotation services to investment managers.
- Quotron Systems supplies a comprehensive on-line securities and commodities quotation service to national brokerage houses such as Merrill Lynch as well as to regional and local firms.

b. Banking and Finance Sector Industry Markets

- Quotron provides services to all segments except the savings and loan segment.



c. Company Strategy

- Although a small company, Quotron recently commanded some 70% of the electronic stock quotation and on-line financial information services market.
- Quotron developed its mastery of the market by concentrating on this one niche and developing its own advanced terminal.
- Quotron hopes to maintain its lead by staying ahead of larger competitors technologically and by knowing its market in greater depth than the newcomers.

d. Recent Activities

- Quotron is expanding its product and service offerings into a personal financial workstation with the ability to handle financial computation, word processing, electronic mail, and other office automation functions. The Q1000 replaces the Q800 and is based on the Motorola 68000 microprocessor.
- Although Quotron has received offers from interested suitors, such as Citicorp, it hopes to stay independent.

e. Future Direction

- Quotron finds itself in an increasingly competitive market as large banks, brokerages, and large IS vendors find the opportunities attractive.
- Home banking, investment advisory services, and other new developments in the industry may enable more vendors to participate profitably.



10. TELERATE

a. Products and Services

- Approximately 25% of Telerate's revenue comes from the banking industry. Telerate's financial information services are used by the trust and corporate divisions and by bank administration to track interest rates, exchange rates, and international financial markets.
- Telerate supplies national and international financial information services in an on-line environment. The information includes interest rates, exchange rates, financial commentary, and major announcements in financial markets.
- Telerate provides financial information services to investment management companies.

b. Banking and Finance Sector Industry Markets

- Telerate provides its on-line services to all segments.

c. Company Strategy

- Like Quotron in security trading, Telerate specializes in one type of service.
- Telerate increased revenues by 40% in 1985.

d. Future Direction

- Telerate is in an enviable position as its base of customers is fast growing. More institutions, and many outside the industry, have need of its special information.



- Telerate faces eventual takeover activity from large banks or other IS providers.

C. SIGNIFICANT COMPETITIVE ACTIVITY BY ADDITIONAL VENDORS

I. FINANCIAL INSTITUTIONS

- The number of credit card processing associations has been reduced to four following the acquisition of Computer Communications of America by the National Bank of Detroit. At least two of the remaining four associations are in negotiations with other processing vendors, including National Data Corporation (NDC) and Nabanco.
- NDC is in a joint venture with Barnett Banks, an \$11 billion holding company, to market CENTRICS, a treasury workstation utilizing the IBM PC. The treasury workstation allows different managers to interact with Barnett Banks for cash management, money transfer, ACH, and account reconciliation.
- Besides processing for 65 affiliates in the holding company, MTech provides correspondent processing services for 700 banks in the Southwest. The company implements and manages MPact, a shared ATM system, providing intercept services through its Tandem-based EFT switch. MTech is now offering turnkey systems for both MICR data capture and ATM/POS financial transaction networks. With 30% annual growth, MTech is the leading processing services vendor in the Southwest.
- Mellon Bank provides retail correspondent processing services to over 220 banks in 16 states from Vermont to Arizona through its Data Center Services Division. Mellon Bank recently acquired the correspondent data processing services of the Bank of Boston. Mellon provides ATM services through operating CASHSTREAM, a shared local network interfacing with the CIRBUS national network.



- Bank of America provides an extensive array of automated business services, particularly payroll. Recent acquisition of Managistics from Chase extends coverage from California through Chicago to the East Coast.
- In order to retain greater control over electronic transactions, a consortium of 42 primarily very large banks sponsored the development of two shared ATM networks--CIRRUS and PLUS. The CIRRUS network interconnects over 7,000 ATMs in 44 states. The PLUS network has somewhat fewer ATMs, but about equal national coverage.
- First Interstate Bank Corporation is standardizing the delivery of its technology-based retail banking products throughout its 13-state bank holding company banks and affiliates. First Interstate was a leader and founding partner of the Cirrus network. Its Teller Item Processing System (TIPS) allows customers to have account access in its 13-state network. Its Administrative Branch Communications System (ABCS) is used to market a wide variety of product services in the retail marketplace. NOVA, Interstate's POS system, provides credit card and check authorization services to well over 5,000 terminals in 13 states. First Interstate is marketing its electronic services on a franchised basis to banks as far away as Minnesota, Hawaii, and Florida.
- Security Pacific Corporation has formed an automation company as a subsidiary to offer total electronic banking to its 400 correspondents and affiliates. Services that the automation company offers are:
 - Interactive computing.
 - Capital market services.
 - Electronic banking.
 - Funds transfer, clearance, and back office notification services.



- The establishment of data processing as one of its four main lines of business, which include wholesale banking, retail banking, and other financial services, is seen as giving recognition to Security Pacific's strategy of delivery of national and eventually international financial information services through electronic networks.
- National Bank of Detroit (NBD) Corporation is both consolidating the back room activities of its 18 affiliates and becoming one of the largest ATM/POS bank card transaction processors in the Midwest.
 - NBD processes more than 1.5 million bank card transactions monthly, interconnecting 600 ATMs at over 100 regional financial institutions.
 - NBD also serves as the electronic switch that connects its Network One with the Cirrus national ATM network.
 - NBD recently purchased Computer Communications of America, a credit card authorization and processing association which operates one of the largest point-of-sale networks in the Midwest.
- Exhibit III-2 lists leading vendors of electronic banking services and their capabilities.

2. INFORMATION SERVICES VENDORS

- Tymnet is processing over 10 million POS transactions monthly for over 28,000 terminals for MasterCard.
- UCCEL is upgrading and integrating its banking software under its INFOPOINT program.
- Comdata Corporation has found a vertical market niche in providing check guarantee/funds transfer services to the trucking and leisure time industries.



EXHIBIT III-2

LEADING COMMERCIAL BANK VENDORS OF ELECTRONIC INFORMATION SERVICES

| | Mellon National | Bank of Boston Corp. | Mercantile Texas | Irving Bank Corp. | Wachovia Corp. | First Interstate | Banc One | NBD Bancorp |
|---|---|------------------------------|------------------------------|-------------------------|---------------------------------|--------------------------|--|--|
| Percentage of Local ACH Processes | 90% | 15% | — | — | 41% credits 62% debits | 28% | 42% | 60% orig traffic 15% rec'd traffic |
| Data Processing for Correspondent Banks (Number of Institutions) | 250 | 460 | 480 | 500 | — | 65 | 200 | 10 |
| Provides Switching Facilities | / | / | / | — | — | / | / | / |
| Central Information File by Name or Number | / | / | x | / | / | / | / | / |
| Automated Back Office for Telecommunication Messages and Wire Transfers | x | / | — | / | — | / | — | / |
| On-Line Cash Management Systems | / | / | / | / | / | / | / | / |
| Real Time/Microprocessor Cash Management System | x | x | x | x | x | x | x | / |
| ATM Networks | | | | | | | | |
| • Regional | CASHSTREAM | MONEC | MPACT | — | RELAY | — | / | Network One |
| • National | CIRRUS | PLUS | CIRRUS | — | CIRRUS | CIRRUS | / | CIRRUS |
| Average Number of Transactions Per Machine, Per Month, and Number of Card Holders | 7,000/ 950,000 | 8,000/ 400,000 | 7,000/ 1,500,000 | — | 8,000/ 450,000 | 7,500/ 4,700,000 | — | 7,400/ 26,000 |
| Experimental Services | Home Banking; Pilot ATMs in Giant Eagle Supermarkets | ATMs in Super- markets | ATMs in Super- markets | — | Video- financial Services | Home Banking; NOVA | Video- financial Services; ATMS in POS Program | Proprietary Home Banking Pilot and POS Large Retailers |

/ Service provided. x Service not provided Source: Salomon Brothers Inc.



Market expansion was achieved through acquisition of INSTACOM, which operates the CASHEX system in supermarkets. By concentrating in highly specific market areas, Comdata has been able to achieve revenue growth exceeding 27% annually over the past five years.

- First Data Resources (FDR) has been able to successfully leverage its credit card authorization technology into offering telemarketing, especially television marketing and airline reservations services (Peoples Express). Nearly 30% of annual revenues come from services other than credit card processing.
- Besides operating the regional ACH in California, GEISCO has been authorized to implement a national ACH clearance network due for operation in the fall of 1985. GEISCO also offers a distributed processing service using IBM PCs for lead banks to resell to end users, at \$250 per month per user. The service includes cash management, accounting, general ledger, accounts receivable, accounts payable, electronic mail, and data base access.
- SEI, Inc. has successfully shifted its trust applications software called the Quantum System to IBM-compatible mainframes.
- National Computer Systems (NCS) has added voice commands to its Trustware software to produce a turnkey system utilizing Texas Instruments' personal computers and Speech Command systems. Voice commands are used to accomplish over 40 types of queries from customer data bases in small- to medium-sized trust departments.
- Systematics, Inc., long a facility manager and processor for medium-sized banks, is in the process of integrating and upgrading its "Family Financial Systems Software" to provide on-line--near real time--operation for large and very large retail banking operations. The integrated software appears likely to offer a total retail solution to all but perhaps the very largest money center banks.



- Cullinet has expanded its presence in the Banking and Finance marketplace through its acquisition of Bob White Software, Inc. Cullinet also has a joint agreement with EDS for implementing Cullinet DBMS software for current and future EDS banking FM clients.

3. COMMERCIAL INSTITUTIONS

- National companies, nonbank in nature (primarily free of regulation), are seen as applying national communications technology in offering consumer financial services at a cost base considerably lower than can currently be offered by even money center banks, let alone regionals and independents.
- Perhaps the most significant company in the area is Sears, Roebuck and Company. Through acquisitions of S&Ls, banks, and brokerages, and with real estate agents added to its existing credit and insurance capability, Sears has transformed itself into a national financial services enterprise.
 - Sears' latest offering, its Discover card, will permit a wide array of credit/debit transactions for Sears' evolving services. Sears' recently established Payment Systems Division offers private label credit card services, credit processing, and lockbox services through its national network interconnecting 830 stores in 49 states.
- J.C. Penney, through its Credit Services Division, is offering a wide array of financial transaction services to retailers, including oil companies, through its national network interconnecting 1,600 stores.
- Not to be outdone, Kroger Company intends to establish a branch banking network in its grocery stores in North and South Carolina. Kroger has implemented store bank branches in Georgia through a joint agreement with Heritage Bank of Atlanta. Safeway stores is another supermarket chain with a pilot ATM program.



- Other corporations with national distribution presence involved in bank-like financial services are Shearson-American Express and Prudential-Bache. Merrill Lynch, perpetrator of the "money management" account, has signaled its intention of entering the banking business through acquisition of a state bank charter in New Jersey.
- However, commercial banks and the FED still have a firm control on the wholesale marketplace, controlling the money supply through clearance, discount, and reserve operations.





IV INFORMATION SYSTEMS DEPARTMENT OUTLOOK

A. DRIVING FORCES

1. CHANGING REGULATIONS

- The changing regulations of federal and state governments in the Banking and Finance sector are dramatically affecting this sector's competitive environment. The barriers to interstate banking are crumbling. Loopholes in the current laws are reducing the number of single unit regional banks.

2. CHANGING INSTITUTIONS

- Money center banks are establishing regional offices that technically are not banks. They are either loan offices or pure depositories.
- To counter the encroachment by the money center banks, regional banks are forming interstate holding companies that typically consolidate operations and information systems organizations.

3. NEW TECHNOLOGY

- New technology, primarily in the form of intelligent network automated teller machines (ATMs) and ancillary services, has provided new expanded distribution channels for banking and financial services. This has also provided the



opportunity for nontraditional competitors such as retail organizations to enter the financial services industry. The primary vehicles for entry are the point-of-sale (POS) terminals and intelligent networks.

4. EXPANSION OF SERVICES

- Banks are likewise expanding services to include insurance and are leveraging their investment in networks and support software. As one of the respondents to the annual survey stated, "Banks are in the financial information business."
- This volatile sector is experiencing an extreme shakeout and consolidation by participants. This shakeout is affecting all sizes of institutions; the survivors will be the institutions that can leverage technology to provide product differentiation.
- The Banking and Finance sector must change from a staid, highly regulated environment to one of wide open competition, similar to the retail sector, yet maintain prudence and the confidence of their customers. Currently, too many are not successful, and public confidence in banking is lowest since the Great Depression.

B. ISSUES AND OBJECTIVES

I. SOFTWARE OBSOLESCENCE

- Software is becoming obsolete faster due to competition and deregulation. There is a need for shorter development cycles and more flexible software.
 - Bank services are proliferating so fast that most systems development staff cannot keep pace.



- Many bank systems are over 10 years old and do not account for the need for customer- versus function-oriented data bases.

2. DEMAND FOR ELECTRONIC INFORMATION DELIVERY

- The advent of ATMs and the interbank electronic funds transfer (EFT) systems has made communications one of the key areas of change affecting this sector's information services (IS) departments.
- The growing demand for electronic information delivery is also affecting the internal organization.
 - Customers having multiple accounts and numerous services are becoming more common.
 - The increased competition from within and outside the sector requires timely account information to be delivered throughout the organization.

3. CHANGE TO CUSTOMER-ORIENTED DATA STRUCTURE

- Major banks are planning to develop information architectures that are customer oriented.
 - Systems development has been on an applications (i.e., product) basis. Because of this structure, banks have a difficult time associating a customer with the services the banks perform. Banks are also having difficulty developing prospects for services from their current customer base.
 - Developing this architecture is a major undertaking. The key will be creating a network of information from compatible data bases. This task will involve restructuring most systems in the organization. Those



institutions that are undertaking this task are planning for up to five years to achieve their goal, with expenditures that may exceed \$1 billion.

- The need for this new acceptance is amplified by the growing use of ATMs. Max Hopper, formerly Executive Vice President of Bank of America, estimates that the ATM environment will drive the transaction volume in major banks to 1,000 per second by 1990.

4. BANK MERGERS AND ACQUISITIONS

- Deregulation and the eroding barriers of interstate banking are accelerating the rate of bank mergers and acquisitions. This leads to consolidation of IS departments into information service companies in multi-bank holding companies.
- Systems compatibility becomes a major issue. As different banks begin using a single source for information services, the migration to a compatible system becomes paramount if the efficiencies inherent in this consolidation are to be realized.
- Most consolidations are only occurring at the data center. Systems development and maintenance still remain in the individual banks. Ultimately, the respondents that are consolidating are planning to consolidate the systems development groups also, but this is a longer term and more complex goal.

5. COST CONTAINMENT IS THE MAJOR OBJECTIVE

- Even though the banking and finance sector is experiencing the most technological opportunity (and disruption) of any sector, the top IS objective is still cost containment.



- Increased competitive pressures have translated into cost containment strategies for administrative systems.
- Until recently, bank profitability has been under severe pressure due to poor loan performance. Management is trying to reduce costs to keep its equity position high enough to prevent regulatory intervention.
- Banking management is in a dilemma regarding information systems since banks must invest heavily in new systems and technologies to meet the competitive threat of other financial institutions, insurance companies, and nontraditional competitors such as retailers.

C. MANAGEMENT PERCEPTION AND ORGANIZATIONAL ISSUES

1. MANAGEMENT VIEWS DIFFER

- Most IS managers believe their management views IS as a corporate asset. However, the middle management in this sector still views IS as an unavoidable cost.
 - This is due to senior management's strategic view. They see IS as a key competitive tool and a major component of new services.
 - Middle management still sees IS as an expense that they cannot control. Most areas have not realized increased revenue from IS-based services. Until this occurs, the middle manager's attitudes will not change.

2. THE MEASUREMENT OF INFORMATION SERVICES VALUE

- IS measurements to management has centered on two major factors:



- Cost. Meeting budget constraints and having spending levels comparable with key competitors is key.
- Return on Investment and Cost Benefit Analysis. Although these analyses have occurred in the past, more emphasis is being placed on revenue producing versus cost reduction tasks. The use of post-implementation analysis is still rare. It appears that once a project is approved, it will be implemented and remain in operation until someone can convince management it should be replaced. This must change. The post-implementation analysis is vital to the success of the project and the profitability of new services.
- Some institutions view IS as essential to their success, so essential that no measurement of success is required. This is a two-edge sword.
 - It alleviates the IS department from proving its worth to the organization.
 - It may minimize the benefit of IS to the organization. Management may perceive a value of IS that is less than its true potential. It is IS' responsibility to sell itself to management. Even if management does not require it, IS must initiate a sales campaign of its own.
- Exhibit IV-I shows the measurement techniques used in banks. The success of these techniques have been about average.

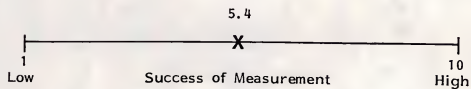
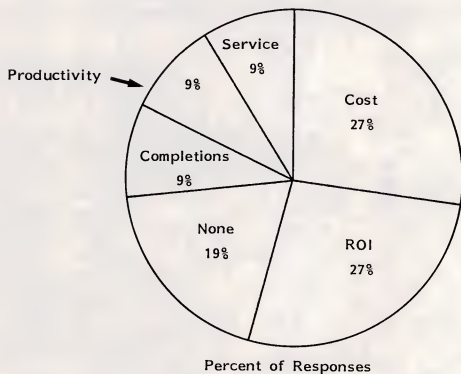
3. CHANGE IN THE ROLE OF INFORMATION SERVICES

- IS' status has increased in the last two years. The head of IS reports to the president, vice chairperson, or executive vice president level. They are moving away from reporting to the financial segment of the organization and are being viewed as an operating and, in some cases, a profit center of the organization.



EXHIBIT IV-1

BANKING AND FINANCE
METHODS OF INFORMATION SYSTEMS MEASUREMENT TO MANAGEMENT



III-BF-71



- IS is becoming an equal participant in the strategic planning process. In the next two years, IS will be taking a larger role in product development. Most IS managers now consider their major role in this period will be to improve information delivery, with the head of IS becoming the chief information officer.
- Banks believe information systems can become a competitive weapon in the sector by:
 - Reaching customers by electronic delivery of information.
 - ATM.
 - Home banking.
 - EFT (electronic funds transfer).
 - Developing flexible systems that improve the institution's ability to react to outside influences (e.g., competition and deregulation).

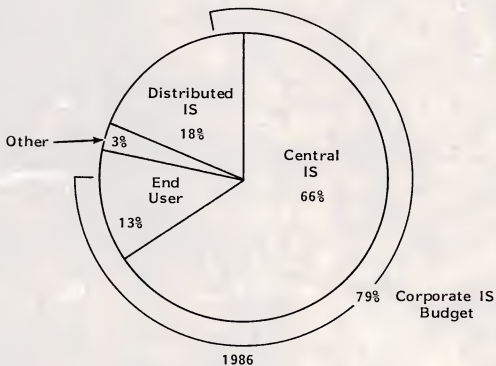
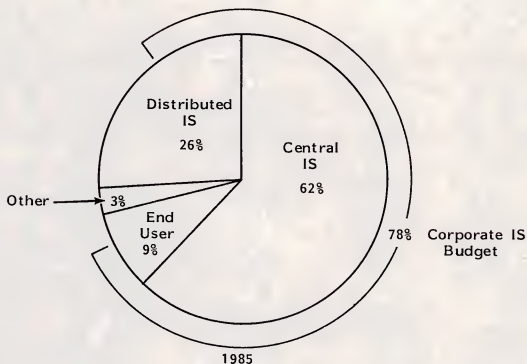
4. MOVEMENT TOWARD CENTRALIZATION

- There is a slight movement toward more centralization of IS. This is consistent with the trend toward developing a compatible systems architecture to enhance the information delivery throughout the organization. In 1986, corporate IS will control approximately 79% of corporate computing expenditures. Exhibit IV-2 summarizes the distribution of corporate computing expenses among central, distributed, and end-user computing in 1985 and projected for 1986.



EXHIBIT IV-2

BANKING AND FINANCE
DISTRIBUTION OF CORPORATE COMPUTING EXPENSES



Percent Corporate and Company-Wide IS Budget

III-BF-73



D. THE IMPACT OF TECHNOLOGY

I. MODERATE OR LOW IMPACT FOR MOST AREAS

- End-user computing is having a moderate impact on this sector. Most organizations are marshalling resources to support personal computers, not end-user computing in general. They see their role as satisfying users' immediate needs and not anticipating future requirements (see next section).
- Departmental processing is viewed as having a low impact in this section. Ultimately, departmental processors will be part of an office automation strategy, but the current centralized focus of developing a central systems architecture is deferring any action in this area.
- Distributed systems development has received little attention in this sector due to the current centralized focus.
- Relational data bases on mainframes have had little activity other than study and some pilot programs.

2. VOICE/DATA INTEGRATION IS THE MOST SIGNIFICANT NEW TECHNOLOGY

- Voice and data integration is believed to have high impact on this sector. Electronic information delivery is vital to the success to banks and financial institutions. The cost of networks is a key concern, and merging voice and data networks is a means of reducing costs.
- Local area networks (LANs) have had limited use in this sector. The lack of LAN standards has also delayed extensive use.



- Exhibit IV-3 summarizes the impact of the above technologies to the banking and finance sector.

E. END-USER COMPUTING

- As discussed in the previous section, end-user computing is perceived as having a moderate impact on the IS organization. However, end-user computing, including hardware and support, is projected to grow from 4% in 1985 to 7% of the IS budget in 1986. Most of this growth will be in training and microcomputer support.

1. THE ROLE OF THE INFORMATION CENTER IN TRAINING

- The information center (IC) has been the focal point for end-user training. The responsibilities of the IC have been expanded to include microcomputer support and most end-user training. Some organizations have begun using computer-based training as part of their training program, but most are limiting microcomputer training to classroom training of selected software packages.

2. INFORMATION SERVICES' ROLE IN MICROCOMPUTER SUPPORT

- Exhibit IV-4 summarizes IS' role in microcomputer support.
 - Most IS organizations now take an active role in micro selection, primarily through identifying preferred equipment to ensure compatibility throughout the organization.
 - Micro software development is performed by IS, but most software are standard packages.



EXHIBIT IV-3

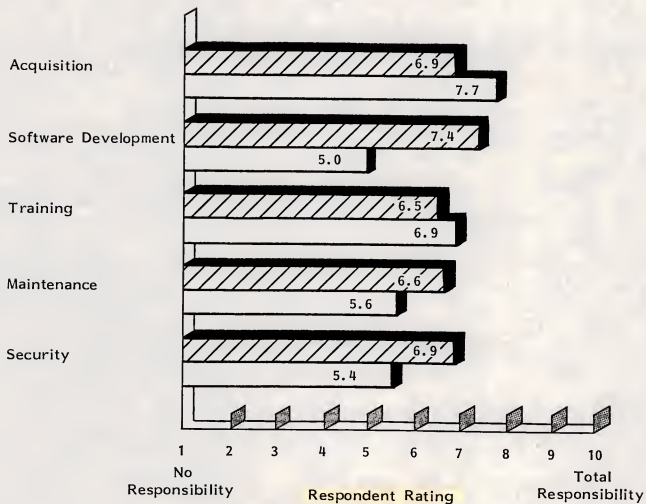
BANKING AND FINANCE
IMPACT OF TECHNOLOGY

| | IMPACT | COMMENTS |
|---------------------------------|--------|---|
| End-User Computing | Medium | Most using IC for support. See as future force, but now in control phase. |
| Departmental Processing | Low | Unsure of application other than office automation. |
| Distributed Systems Development | Low | Very little activity. |
| Relational Data Bases | Low | Most studying the issue, very little implementation activity. |
| Voice/Data Integration | High | All investigating - believe high potential for cost savings. Most plan to use voice/data CBX within next two years. |
| Local Area Networks (LANs) | Low | Low usage, lack of LAN standards have inhibited corporate commitment. |

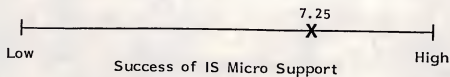


EXHIBIT IV-4

BANKING AND FINANCE I.S. ROLE IN MICROCOMPUTER SUPPORT



☒ Banking/Finance
 ☐ Overall



III-BF-77



- Most training is conducted by IS through the IC.
- This sector takes a more active role in maintenance than other sectors, primarily by coordinating service agreements through vendors for the entire organization.
- Security is a very controversial item. IS establishes standards that end users must follow. The electronic data processing (EDP) audit function is responsible for monitoring compliance. Most respondents, however, have just begun establishing these standards.
- Most respondents believe their microcomputer support is very good. IS has taken a leadership role in micro support due to the need for compatible systems, especially with the growing demand for micro-mainframe interfaces. The most successful institutions are ones that emphasize customer service versus authoritarian control.

F. NEW APPLICATIONS

- The most important new applications are actually new versions of fundamental banking applications--demand deposit accounting (DDA) and loan applications.
- The changing economics of delivery services is rendering fundamental systems obsolete. Many of these systems are over 10 years old. They have been heavily modified and do not interface with other systems.
- The move toward developing a central architecture requires that these core systems conform to this central structure. Typically, these systems would be the first to be assigned since they comprise the foundation of the banking business.



- Consolidation of multiple bank IS departments under a single holding company division is creating a need for either a single system or compatible systems that can service all banks within the holding company.
- Information delivery within the organization is creating a high demand for query and customer information systems. External delivery of information is being driven through the ATM/POS networks. These networks are providing a vehicle for customer information and services that can provide a competitive advantage to financial institutions.
- Forty-two percent of the major new systems are being developed by internal staff only, 32% are developed externally via packages and contract personnel, and 26% are developed by both internal and external resources. The shift from internal to external resources is caused by the rapidly changing competitive and regulatory environment.

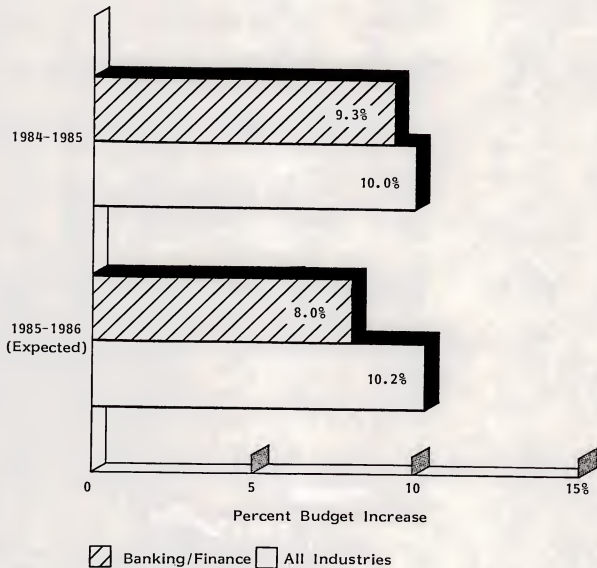
G. INFORMATION SERVICES BUDGET ANALYSIS

- Banking and financial institution IS budgets are growing at a slightly lower rate than IS budgets overall. This is due to cost containment and consolidation objectives.
 - Exhibit IV-5 shows that this sector's IS budget growth lagged behind the IS budgets of all industries in the 1985 period (9.3% versus 10%) as well as being projected to trail overall IS budgets in 1986 (8% versus 10.2%).
 - Exhibit IV-6 shows the 1985 budget distribution and projected growth of budget categories in 1986. Expenditures for external services (e.g., software and professional services) are the only budget categories projected to decrease.



EXHIBIT IV-5

BANKING AND FINANCE
I.S. BUDGETS ARE GROWING SLOWER THAN ALL I.S. BUDGETS



III-BF-80



Figure 10. The effect of CaMKII inhibition on calcium spikes. *a*, The effect of the CaMKII inhibitor KN-93 on calcium spikes. *b*, The effect of the CaMKII inhibitor KN-93 on calcium spikes. The traces show the effect of the CaMKII inhibitor KN-93 on calcium spikes. The traces show the effect of the CaMKII inhibitor KN-93 on calcium spikes. The traces show the effect of the CaMKII inhibitor KN-93 on calcium spikes.

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EXHIBIT IV-6

1985 BUDGET DISTRIBUTION AND 1985/1986 CHANGES
IN THE BANKING AND FINANCE SECTOR

| BUDGET CATEGORY | 1985 PERCENT OF I.S. BUDGET | 1985-1986 EXPECTED BUDGET GROWTH |
|--------------------------------|-----------------------------------|---|
| Personnel Salaries and Fringes | 38.3% | 8.8% |
| Mainframe Processors | 7.7 | 12.0 |
| Minicomputers | 3.5 | 26.8 |
| Microcomputers | 2.6 | 0.0 |
| Mass Storage Devices | 2.7 | (7.5) |
| Other Hardware | 6.3 | 3.0 |
| Total Hardware | 22.8% | 10.5% |
| Data Communications | 13.0% | 8.2% |
| External Software | 3.4 | (5.0) |
| Professional Services | 1.2 | (5.4) |
| Turnkey Systems | 1.3 | 0.0 |
| Software Maintenance | 0.9 | 7.5 |
| Hardware Maintenance | 4.3 | 3.8 |
| Outside Processing Services | 2.3 | 1.8 |
| Other | 12.5 | 3.2 |
| Total | 100.0% | 8.0% |



- Hardware is the largest projected growth category at 10.5% in 1986.
- Ninety-one percent of the respondents in this sector said their 1986 budgets will increase, but 58% stated this increase would be a lower growth rate than 1985.
- Factors contributing to increasing the IS budget included (in order of most frequently mentioned factors):
 - Personnel expense.
 - Hardware.
 - Software.
 - Inflation.
- Factors contributing to decreasing the IS budget included:
 - Enhanced productivity.
 - Hardware depreciation.
 - Expense control.
 - Data center consolidation.
- The banking and finance sector's IS budget is more dependent on revenue and less dependent on profit than IS budgets overall. Many respondents said they were in the information delivery business, and management is beginning to realize the potential competitive advantage of information systems. However, severe cost containment pressures in many organizations are causing slower budget growth.



V OPPORTUNITIES

A. MARKET NICHES

- The Banking and Finance segment is too large and complex for any one vendor to be all things to all sectors. The opportunities are many, but vendors must strategically select those market niches which are financially attractive and which match vendors' technology, technical expertise, and distribution capabilities.
- For example, the shift to merchant banking (investment banking in disguise) is a business line requiring new and innovative financial information system products and services.
- Additionally, computer services industry consolidation/partnering will occur to provide total solutions in targeted market niches.
- Industry competition is creating demand for decision support systems beyond those used in the corporate environment. In the personal services area, brokers, retailers, and other nonbank financial groups will require financial data and services to address customer needs. Products included will be portfolio analysis systems, market analysis systems, and many more, including on-line data bases.



- Many of the emerging opportunities will require sophisticated solutions, often multidisciplinary. Hardware and other vendors will require partners and subcontractors to provide complete solutions. This will continue to create opportunities for smaller and highly-specialized vendors. Specific opportunities will exist in developing programs to educate personnel on security and security procedures, in systems development, and in the implementation of new systems and the replacement of old ones.

B. VALUE-ADDED NETWORKS

- Banking and finance services are increasingly being delivered electronically. The key to successful processing services offerings will be value-added network services offerings. Vendors must possess the capability of converting, interfacing with, and transmitting a wide variety of information protocols and message formats.
- On-line data base services opportunities exist for selling to banks and partnering with banking and financial institutions. Consumer credit reporting is already the largest on-line data base market, yet it has great potential remaining. Check and credit data bases will continue to expand, as will securities.
- As financial institutions become increasingly competitive, they will also need more access to marketing and demographic data bases. Obviously, the best data bases for vendors are dynamic, which are less susceptible to optical technologies like CD-ROM.
- Security and commodity firms themselves are offering an ever-increasing variety of financial services to individual investors, services which require both software products and network services.



- The area of check clearance is no longer the exclusive province of the Federal Reserve Banks. The requirement for the Federal Reserve Bank to price services has opened the door for information services vendor competitive offerings for automated clearinghouse (ACH) services, both regional and national, and check processing services for regional/local bank clearinghouse associations.

C. PROCESSING SERVICES

- Although not growing as fast as other modes, there are very attractive opportunities in processing services.
- Successful vendors will be alert to opportunities which leverage their processing and network technology to offer add-on services to their existing client base or directly to other market areas. Examples are data capture, balancing, and consolidation for retailers who operate POS credit card terminals and providing total marketing services with credit card voice authorization technology.
- Information services vendors must be alert to opportunities for providing processing and other services to groups of financial institutions formed to support operations under changing market conditions. Examples are managing local/regional ACHs and managing information services for bankers' banks.
- Utilizing valuable resources and finding it marginally profitable, many commercial banks are looking to move out of the correspondent bank processing business. Information services vendors, both bank and commercial, can expand their market share through acquiring this business.
- Required to increase capital, selected banks are candidates for acquisition of FM arrangements for their computer service companies.



- In troubled financial times financial institutions are much more willing to shed services not directly related to their main business functions. Financial holding companies are more willing to sell off or make FM arrangements for managing S&L or bank service companies. Carefully targeted banks can be induced to sell off and then offer under private label arrangements correspondent bank processing services.
- Professional services vendors can successfully leverage expertise in data base management systems to offer, through partnering arrangements, implementation services for converting and establishing financial institution customer information bases.

D. SECURITY

- Security is a major issue in banking and finance markets. The issue will greatly increase in importance as the volume of electronic transactions grows to be a significant portion of all financial transactions by the end of the decade. Processing vendors must acquire or partner to obtain secure data systems at terminal entry points and between entry and, as necessary, interchange points and central or distributed hosts.
- The baseline defense of host financial information systems is seen to be selectively layering available technology to prevent both external and internal end users and computer systems operation and programming personnel from gaining unauthorized access to software, micro code, and corporate and consumer data bases which are part and parcel of banks' operational activity.
- In the area of security, new software will be needed to protect from fraud in financial transaction systems and networks. Also, the application of pattern recognition technologies will be an opportunity, as will disaster recovery services for these highly time and data sensitive applications.



- Documentation control, fire protection, and legal and insurance requirements are other areas where policies for security are required.
- Finally, a technology strategy is needed to ensure the "core defense" is implemented in line with the "risk/reward" tradeoffs. In this instance, risk/reward simply means the tradeoff of providing "absolute" security to the cost of protecting against the potential for fraud or other loss.
- Exhibit V-1 compares current security methodologies by cost and effectiveness.

E. STRATEGIC PARTNERING

- In a recent INPUT report on professional services opportunities, INPUT emphasized the importance of strategic partnering in providing system integration and software implementation services and of participating in the evolution of new distribution channels.
 - The trend is toward providing total solutions to end users.
 - The proliferation in personal computers and intelligent terminals is resulting in end users with a greater understanding of computer-based solution possibilities, a primary marketing focus.
 - The competitive edge has shifted from hardware power and product functionality to expertise in vertical markets and marketing and distribution.
 - Hardware vendors—even IBM—are moving out into the marketplace to seek needed market resources to deliver their products and services.



EXHIBIT V-1

LEVELS OF SECURITY

| LEVEL | OPTION | ADVANTAGES | DISADVANTAGES |
|-------|------------------------------|--|---|
| 1 | Passwords | Low Cost | Most Vulnerable |
| 2 | Terminal IDs | Low Cost | Inflexible |
| 3 | Security Monitors | Good Security Audit Trail | High Cost Needs Administration Susceptible to Systems Programmers |
| 4 | Encryption | High Security | Major Cost Degrade System Performance Needs Administration |
| 5 | Telephone Access Controllers | Good Internal Security High External Security Good Audit Trails Analog System | Internal Security Susceptible to Systems Programmers |
| 6 | Smart Cards | Very High Security Authentication of Both User and Host Flexible | Currently High Cost Needs Administration |



- It is clear that banking and finance markets are going national. Vendors must establish national presence either directly or through carefully selected partnering arrangements.
- Medium to very large bank holding companies are excellent targets for offering information services and for strategic partnering arrangements.
- Information services vendors may obtain a high degree of complementarity through strategic partnering. The partnering should be for clearly defined objectives such as national market coverage, implementation capability, market expertise, etc. Successful partnering may well be prelude to future merger/acquisition possibilities between interested parties.

F. SPECIAL PRODUCT AREA OPPORTUNITIES

I. APPLICATIONS SOFTWARE

- Applications software products which are specific to the banking and finance industries will be a \$3.5 billion market in 1990.
- The financial market has always been the largest purchaser of applications software. Given the demand for new systems and the time requirements for these systems, banking and finance companies will continue to elect the buy side of the make/buy decision. All the trends support the growth of this practice. Vendors will also find financial institutions willing to jointly fund or partner particularly large projects such as financial transition software and network development.
- The software for the mainline operations of demand deposit accounting, savings, loans, and administration is for the most part obsolete. Banks and



other financial institutions need new software which integrates the customer data base with its major applications and which can handle electronic transaction rates.

- The market is shifting to the cost side of the delivery equation.
 - Provision of total solutions to product lines of business would be warmly greeted.
 - Industry-specific applications which show bottom line profitability will be the order of the day.
- Exhibit V-2 cites examples of micro applications software for the banking and finance industry.

2. THIRD-PARTY ATM/POS SERVICES

- The days of brick and mortar branching are over. Even after pricing retail services closer to cost, Bank of America is still closing over 200 branches in California. Citibank has begun testing automated banking units (no tellers), including Citibank's CAST (Customer Activated Service Terminals) system.
- The growth of electronic banking has been phenomenal. Exhibits V-3 and V-4 give the number of ATM networks and cards in the U.S. in 1984.
- Both ATM and POS networks can be expected to expand during the next decade. Home banking and automated check clearing will also grow, as shown in Exhibit V-5.
- Not all of these industry institutions will develop their own ATM/POS networks nor will they wish to align themselves with potential competitors. Therefore, opportunities for network services vendors to offer third-party selections will exist and prosper.



EXHIBIT V-2

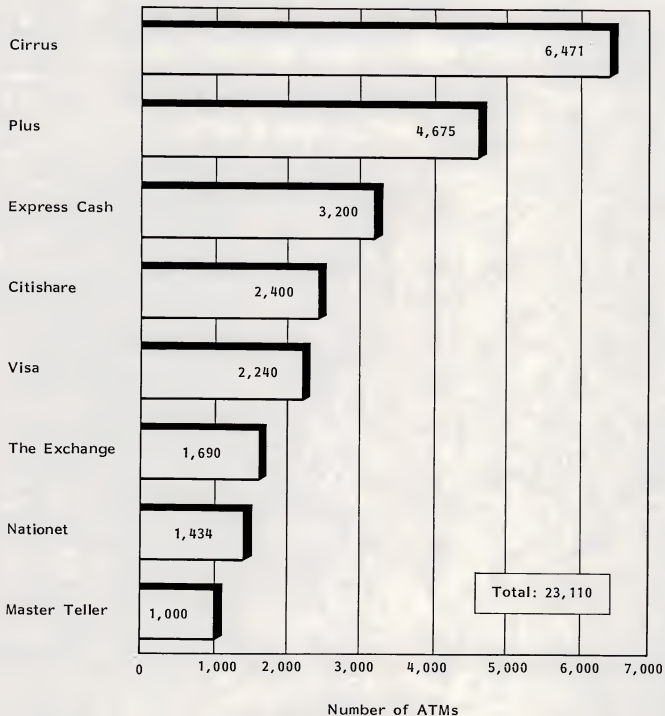
EXAMPLES OF INDUSTRY-SPECIFIC MICRO APPLICATIONS SOFTWARE FOR THE BANKING AND FINANCE INDUSTRY

| | |
|-----------------------------------|--------------------------------|
| Asset/Liability Management | Discount Brokerage |
| 30-60-90-180-360-Day Gap Analysis | Bond Analysis |
| Real Estate Investment Analysis | Mortgage Analysis |
| Lease/Purchase Analysis | Tax Planning |
| Shareholder Accounting | Letters of Credit |
| Currency Control | Foreign Exchange |
| Escrow Accounting | Employee Benefit Accounting |
| Repurchase Agreement | Customer Profitability |
| Safe Deposit Box Management | Loan Origination |
| Branch Performance | Lock Box Processing |
| FDIC Reporting | Agricultural Credit Analysis |
| Loan Pricing Profitability | IRA Illustration |
| Credit Analysis | Security Investment Management |
| Loan Document Processing | Portfolio Analysis |



EXHIBIT V-3

LEADING NATIONAL SHARED AUTOMATED TELLER MACHINE
NETWORKS INSTALLED BASE, 1984



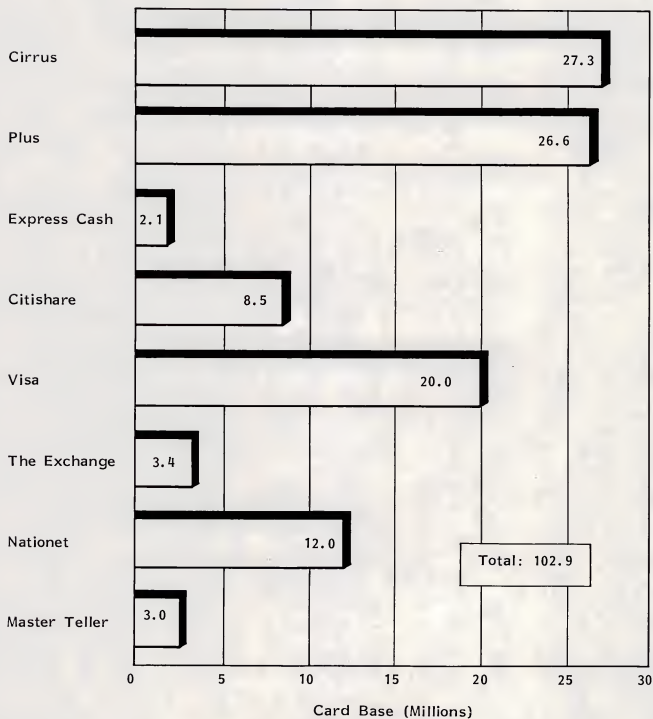
III-BF-92

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EXHIBIT V-4

LEADING NATIONAL SHARED AUTOMATED TELLER MACHINE
NETWORKS CARD BASE, 1984

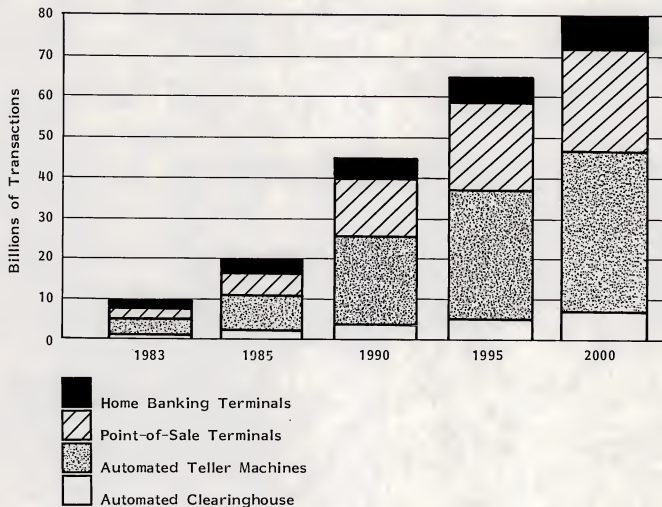


III-BF-93



EXHIBIT V-5

FORECAST OF U.S. ELECTRONIC PAYMENTS, 1983-2000



Source: Federal Reserve Board (FRB), American Bankers Association (ABA).

1. Introduction

1.1

1.2

1.3

1.4

1.5

1.6

3. SYSTEMS INTEGRATION FOR NONSTOP TURNKEY SOLUTIONS

- Services are increasingly targeted toward larger institutions and multibank holding companies.
- Facility management and system integration arrangements are forecast to be particularly attractive for medium to large institutions across all sectors during the decade. The role of the system integrator will become increasingly important as the distinction between information processing and telecommunications technology becomes blurred.
- System integration opportunities will be plentiful throughout the banking and finance sector. The complexity of transaction processing systems, expanded networks, and increasing transaction volume will all contribute. System integrators need to understand the technology in depth and form alliances to build and implement these complex systems.
 - Product and services offerings are increasingly national in nature.
 - Total solutions are seen to be the order of the day, while networks play an increasingly important role.
- As the industry becomes more dependent on automation, the need for nonstop architectures and turnkey opportunities will emerge for vendors in selling to independent banks currently using outside services. Other turnkey opportunities will emerge at the departmental level for systems to handle transaction processing and network management.
- Strategic partnering with fail-safe IBM plug-compatible hardware vendors could easily result in a "turnkey solution" to what would otherwise become a nightmare situation with the rising tide of the electronic transactions initiated through bank debit cards.



- Software and turnkey systems vendors must focus on independent service organization (ISO) and value-added reseller (VAR) arrangements with leading hardware vendors in order to offer systems integration services, resulting in turnkey systems in banking and finance markets.



VI CONCLUSIONS AND RECOMMENDATIONS

- The banking and finance industry is experiencing changes that will profoundly affect what products are offered and methods of delivery.
- Traditional banking philosophy no longer suffices. To remain competitive, the industry must expand services and approach new markets, and it must remain flexible to be able to respond to change.
- Technology is now available which permits more complex products and services, but development is dependent on the regulators of banking and finance providers. Relaxation of the distinctions between financial providers--banks, brokers, credit unions, and the like--is creating a confused marketplace where there is much overlap.
- The opportunities in this marketplace are numerous, but vendors must monitor the trends in regulation as well as the developments in technology.
- The market window is open for new entrants, and there are more competitors than ever before. Strategic partnering is one strategy that increases the potential for success. Market participants will come from both within and outside the industry, as former customers transform into service and product suppliers.



- Key areas that appear particularly ripe for product development are:
 - Information/security systems.
 - Communications networks and on-line product delivery.
 - Nonstop processing.
 - Applications software.
 - Professional services for software development, education, and training, and, particularly, system integration.



APPENDIX BF-A: FORECAST DATA BASE

- This appendix contains the following, as shown in Exhibits BF-A-1 through BF-A-5:
 - Market size by delivery mode for each year 1985-1990.
 - Market growth rates for 1985-1986.
 - Average annual growth rate (AAGR) for each delivery mode for the five-year period 1985-1990.
- These forecasts are for industry-specific services and products only. Excluded are cross-industry products and services such as systems software and value-added network services.



EXHIBIT BF-A-1

INDUSTRY-SPECIFIC INFORMATION SERVICES, 1985-1990
COMMERCIAL BANKS

| Delivery Mode | (\$ Millions) 1985 | 1985/ 1986 Growth | (\$ Millions) | | | | | 1986/ 1990 AAGR |
|------------------------------------|-----------------------|-------------------------|---------------|---------------|---------------|---------------|---------------|-----------------------|
| | | | 1986 | 1987 | 1988 | 1989 | 1990 | |
| Processing Services | | | | | | | | |
| Remote Computing/ Batch | \$1422 | 17% | \$1662 | \$1931 | \$2228 | \$2561 | \$3126 | 17% |
| Facility Management | \$629 | 19% | \$746 | \$883 | \$1041 | \$1202 | \$1364 | 16% |
| Total Processing | \$2,051 | 17% | \$2407 | \$2814 | \$3269 | \$3763 | \$4491 | 17% |
| Applications Software | | | | | | | | |
| Mainframe/ Mini | \$600 | 37% | \$823 | \$1130 | \$1405 | \$1803 | \$2230 | 28% |
| Micro | \$50 | 40% | \$70 | \$100 | \$138 | \$196 | \$281 | 42% |
| Total Applications Software | \$650 | 37% | \$893 | \$1230 | \$1543 | \$1999 | \$2511 | 29% |
| Turnkey Systems | \$361 | 24% | \$446 | \$560 | \$700 | \$866 | \$966 | 21% |
| Sector Total | \$3062 | 22% | \$3746 | \$4604 | \$512 | \$6628 | \$7968 | 21% |



EXHIBIT BF-A-2

INDUSTRY-SPECIFIC INFORMATION SERVICES, 1985-1990
SAVINGS AND LOANS

| Delivery Mode | 1985 | 1985/ 1986 Growth | (\$ Millions) | | | | | 1986/ 1990 AAGR |
|------------------------------|-------|-------------------------|---------------|-------|--------|--------|--------|-----------------------|
| | | | 1986 | 1987 | 1988 | 1989 | 1990 | |
| <u>Processing Services</u> | | | | | | | | |
| Remote Computing/ Batch | \$289 | 17% | \$338 | \$393 | \$453 | \$521 | \$636 | 17% |
| Facility Management | \$72 | 11% | \$80 | \$89 | \$99 | \$106 | \$129 | 13% |
| Total Processing | \$361 | 16% | \$418 | \$482 | \$552 | \$628 | \$766 | 16% |
| <u>Applications Software</u> | | | | | | | | |
| Mainframe/ Mini | \$135 | 28% | \$173 | \$222 | \$256 | \$305 | \$407 | 24% |
| Micro | \$24 | 25% | \$30 | \$38 | \$47 | \$60 | \$96 | 34% |
| Total Applications Software | \$159 | 28% | \$203 | \$260 | \$303 | \$364 | \$503 | 25% |
| <u>Turnkey Systems</u> | \$109 | 10% | \$120 | \$135 | \$149 | \$164 | \$206 | 14% |
| Sector Total | \$629 | 18% | \$742 | \$877 | \$1055 | \$1156 | \$1475 | 19% |



EXHIBIT BF-A-3

INDUSTRY-SPECIFIC INFORMATION SERVICES, 1985-1990
SECURITIES AND COMMODITIES

| Delivery Mode | 1985 | 1985/ 1986 Growth | (\$ Millions) | | | | | 1986/ 1990 AAGR |
|------------------------------|-------|-------------------------|---------------|-------|--------|--------|--------|-----------------------|
| | | | 1986 | 1987 | 1988 | 1989 | 1990 | |
| <u>Processing Services</u> | | | | | | | | |
| Remote Computing/ Batch | \$362 | 23% | \$447 | \$549 | \$668 | \$810 | \$938 | 20% |
| Facility Management | \$126 | 14% | \$144 | \$164 | \$186 | \$206 | \$243 | 14% |
| Total Processing | \$487 | 21% | \$591 | \$713 | \$854 | \$1016 | \$1181 | 19% |
| <u>Applications Software</u> | | | | | | | | |
| Mainframe/ Mini | \$42 | 40% | \$59 | \$83 | \$105 | \$138 | \$167 | 30% |
| Micro | \$9 | 44% | \$13 | \$18 | \$23 | \$32 | \$48 | 39% |
| Total Applications Software | \$52 | 38% | \$72 | \$101 | \$129 | \$170 | \$215 | 31% |
| <u>Turnkey Systems</u> | \$116 | 13% | \$131 | \$151 | \$173 | \$196 | \$239 | 16% |
| Sector Total | \$655 | 21% | \$794 | \$964 | \$1156 | \$1382 | \$1635 | 20% |



EXHIBIT BF-A-4

INDUSTRY-SPECIFIC INFORMATION SERVICES, 1985-1990
OTHER BANKING/FINANCE

| Delivery Mode | 1985 | 1985/ 1986 Growth | (\$ Millions) | | | | | 1986/ 1990 AAGR |
|------------------------------|-------|-------------------------|---------------|-------|-------|--------|--------|-----------------------|
| | | | 1986 | 1987 | 1988 | 1989 | 1990 | |
| <u>Processing Services</u> | | | | | | | | |
| Remote Computing/ Batch | \$338 | 24% | \$418 | \$515 | \$629 | \$764 | \$882 | 21% |
| Facility Management | \$72 | 21% | \$87 | \$104 | \$125 | \$146 | \$163 | 17% |
| Total Processing | \$409 | 23% | \$505 | \$619 | \$753 | \$910 | \$1046 | 20% |
| <u>Applications Software</u> | | | | | | | | |
| Mainframe/ Mini | \$68 | 24% | \$84 | \$105 | \$117 | \$133 | \$185 | 22% |
| Micro | \$11 | 36% | \$15 | \$20 | \$25 | \$33 | \$52 | 36% |
| Total Applications Software | \$79 | 25% | \$99 | \$124 | \$142 | \$167 | \$237 | 24% |
| <u>Turnkey Systems</u> | \$58 | -3% | \$56 | \$52 | \$45 | \$33 | \$62 | 3% |
| Sector Total | \$546 | 21% | \$660 | \$796 | \$940 | \$1109 | \$1344 | 19% |



EXHIBIT BF-A-5

INDUSTRY-SPECIFIC INFORMATION SERVICES, 1985-1990
TOTAL SECTOR

| Delivery Mode | 1985 | 1985/ 1986 Growth | (\$ Millions) | | | | | 1986/ 1990 AAGR |
|------------------------------|--------|-------------------------|---------------|--------|--------|---------|---------|-----------------------|
| | | | 1986 | 1987 | 1988 | 1989 | 1990 | |
| <u>Processing Services</u> | | | | | | | | |
| Remote Computing/ Batch | \$2411 | 19% | \$2865 | \$3388 | \$3978 | \$4656 | \$5582 | 18% |
| Facility Management | \$899 | 18% | \$1057 | \$1240 | \$1451 | \$1660 | \$1899 | 16% |
| Total Processing | \$3308 | 19% | \$3922 | \$4628 | \$5428 | \$6317 | \$7483 | 18% |
| <u>Applications Software</u> | | | | | | | | |
| Mainframe/ Mini | \$845 | 35% | \$1139 | \$1540 | \$1883 | \$2379 | \$2989 | 27% |
| Micro | \$94 | 36% | \$128 | \$175 | \$233 | \$321 | \$477 | 39% |
| Total Applications Software | \$940 | 35% | \$1267 | \$1716 | \$2117 | \$2700 | \$3466 | 29% |
| <u>Turnkey Systems</u> | \$644 | 17% | \$753 | \$898 | \$1475 | \$1262 | \$1473 | 18% |
| Sector Total | \$4892 | 21% | \$5943 | \$7241 | \$8613 | \$10275 | \$12421 | 20% |



APPENDIX BF-B: BANKING AND FINANCE SECTOR DEFINITIONS

- AUTHENTICATE - To determine the accuracy of a user's identity or a message's certification of its time or place of origin.
- AUTOMATED CLEARING HOUSE (ACH) - An automated clearing house exchanges payments between members via computer media such as magnetic tape. The ACH is formed by an association of private depository institutions. Most of the current ACHs are located in the premises of Federal Reserve Banks. The ACHs in Chicago and New York are privately operated.
- AUTOMATIC TELLER MACHINES (ATM) - Allows consumers to initiate deposits to, cash withdrawals from, and other transactions for their bank or S&L accounts.
- BANK CUSTOMER PROFITABILITY ANALYSIS - A statement of the activity cost in an account and the adequacy of the compensation to the bank.
- CASH MANAGEMENT SYSTEM - A group of applications that include:
 - Information for a bank customer on balances, transactions, pending transactions, and operational products. It is gathered within the bank and from other banks.
 - General information on services and interest rates.
 - The capability of initiating transactions, particularly funds transfer.



- CHECK GUARANTEE - Check guarantee is that process by which the services vendor guarantees that uncollectable checks will be purchased at predetermined discounted value from the retailer without recourse. The vendor takes whatever action is necessary, if any, to recover funds from the consumer.
- CHECK TRUNCATION - The process whereby the movement of a paper check is stopped at the depository institution first receiving the check. Pertinent information is converted to an electronic image and processed by the payments clearance system; the customer receives a descriptive account statement. Facsimile check copies are made available as necessary in response to inquiries.
- CHECK VERIFICATION - Check verification is a process by which the vendor advises the retailer of the likelihood that the check is good or bad based on negative data held in the vendor's data base. The retailer retains liability for uncollectable checks.
- CLEARANCE - Clearance is the process whereby retailer check deposits move from the depositing bank through a clearance bank (often the Federal Reserve) to the bank on which the check was drawn.
- CLEARING HOUSE INTER BANK PAYMENT SYSTEMS (CHIPS) - An automated clearing facility operated by the New York Clearing House Association which processes international funds transfers among its members.
- CREDIT CARD AUTHORIZATION - Credit card authorization is the process whereby the services vendor either declines authorization, approves the credit transaction within pre-prescribed limits, or obtains, as necessary, approval from the financial institution holding the credit card account. Credit card losses are borne by the participating financial institution. Provision for credit card losses are bundled in the discount rate on credit card charge amounts the merchant pays for credit card services.



- CRYPTOGRAPHY - A form of access control applicable to sensitive resources that are beyond the scope of program access control and physical access control.
- DEBIT CARD - A card that identifies the holder of a deposit account. It is generally used in conjunction with ATM or point of sale (POS) terminals and aids in the withdrawal of funds. When used with a POS terminal, the funds are then deposited from the buyer's account into the seller's account.
- ELECTRONIC CASH REGISTER (ECR) - An electronic cash register operates as a point of sale (POS) terminal with respect to credit card authorization/check guarantee. ECRs also handle sales, data capture, balancing, and inventory control.
- ELECTRONIC FUNDS TRANSFER SYSTEMS (EFTS) - Use terminals, telecommunications, and computers to accomplish funds transfer between parties, which may be consumers, corporations, or financial service institutions.
- ENCRYPTION - A process for protecting program and data that must be stored on or transmitted over media that cannot be otherwise protected against unauthorized monitoring.
- FINANCIAL INQUIRY SERVICES (FIS) - Provide on-line access to a wide range of security, commodity, bond, money instrument, interest rate, foreign exchange, and option price data bases directly related to activity on national exchanges. The services include the data base, remote computers, the communication network, communication controllers, and the inquiry terminals.
- GIRO - A payment system in which a bank depositor instructs his bank to transfer funds from his account directly to creditor accounts and to advise the creditors of the transfers. The depositor can specify the amount to be paid, in



contrast to a preauthorized debit, which withdraws the same amount or the full amount of the bill each month.

- INTERCHANGE NETWORK - VISA and MasterCard operate electronic switching networks that route credit card authorization messages as necessary between processing participants and financial institutions of record.
- INVESTMENT PERFORMANCE ANALYSIS - The evaluation of investment practices relating to market performance of security holdings.
- LOCK BOX (WHOLESALE/RETAIL) - A special post office box used by a bank to receive customer payments and accelerate the collection of funds by reducing mail and check-clearing float. Lock boxes are usually classified as retail (high-volume, low-dollar amounts) or wholesale (low-volume, high-dollar amounts).
- MONEY MARKET TRADING - Provides a brokerage service for use by corporations and individuals wishing to invest their excess cash in short-term money market instruments.
- MONEY MARKET SWEEP - A review of the balances in a group of customer accounts after the close of daily business that will automatically invest all funds above a set amount in money market funds.
- NEGOTIABLE ORDER OF WITHDRAWAL (NOW) ACCOUNT - A special account that pays a rate of interest and provides check capabilities. The consumer writes a NOW draft (similar to a check) which, when countersigned by the depository institution, allows for third-party payment.
- ON-LINE - A computer system in which source data are collected through input devices that directly feed and are controlled by the computer itself, which may belong to or be located at another institution. Examples of this are the Chemlink balance reporting system and most data processing or switching facilities.



- PASSWORD - Data a user provides for purposes of authentication.
- POINT OF SALE (POS) DEVICE - A device located at a retail outlet, such as an electronic cash register, a key pad activated credit authorization, or check guarantee terminal, for handling both authorization and transaction information.
- QUERY - A request for information from a data base, specifically one for data collected from a number of records and presented as a sum, average, etc.
- SAME DAY TRANSACTION REPORTING - Provision to send details on debit and credit activity to a customer terminal periodically during the day.
- SECURITIES TRANSACTION REPORTING - The use of on-line timesharing facilities to obtain current and pending security transaction information.
- SECURITY CUSTODY ACCOUNTS - A service rendered by banks and depository institutions, usually located in metropolitan areas, whereby securities are received for safekeeping in the vault of a bank for a service fee. This service can include buying and selling of securities, collection of dividends and interest payments, transfer of ownership, and automatic credit and debit entries to the depositor's account.
- SETTLEMENT - Settlement is the process whereby credit card transactions, once balanced at the retail level, are entered at the depositing bank or services vendor, sorted by the institution servicing the retailer, transmitted, and net funds due each participant determined (settled).
- SWITCHING FACILITY - A facility that links ATM and POS terminals to depository and credit-granting institutions to accomplish instantaneous authorizations and fund transfers. It also links and sorts the credits and debits of institutions in an ATM or POS network.



- WIRE TRANSFERS - The electronic transfer of funds from one institution to another through the Federal Reserve Wire, Bankwire, or Swift systems.

